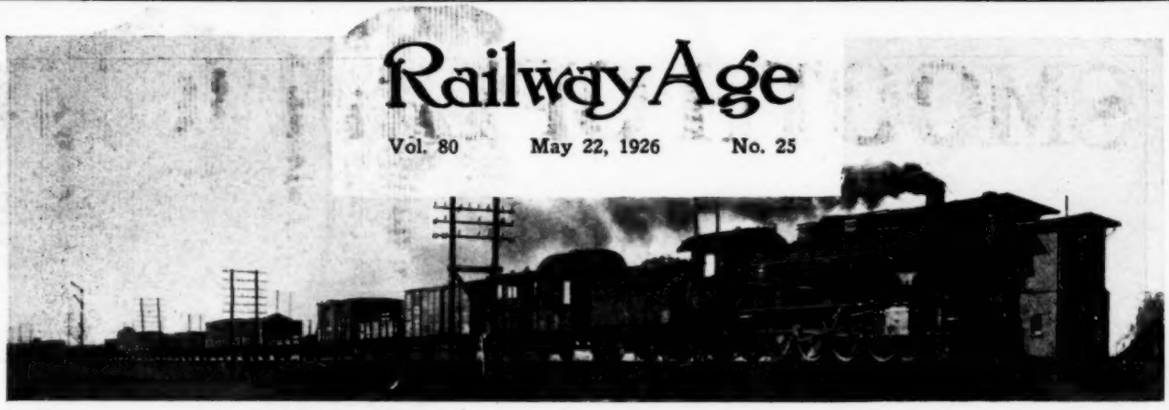
Railway Age

Vol. 80 May 22, 1926 No. 25



A German Freight Train—Photo, Rudolf Kreutzer, Hanover

Contents

Published every Saturday and daily eight times in June by the

Simmons-Boardman Publishing Company, 30 Church Street, New York

EDWARD A. SIMMONS, *President*
L. B. SHERMAN, *Vice-Pres.*
HENRY LEE, *Vice-Pres. & Treas.*
SAMUEL O. DUNN, *Vice-Pres.*
F. H. THOMPSON, *Vice-Pres.*
C. R. MILLS, *Vice-Pres.*
ROY V. WRIGHT, *Sec'y.*

CHICAGO: 608 South Dearborn St. **CLEVELAND: 6007 Euclid Ave.** **LONDON, England: 34 Victoria St., Westminster, S. W. 1.**
WASHINGTON: 17th and H Sts., N. W. **SAN FRANCISCO: 74 New Montgomery St.** **Cable Address: Urasigmec, London**
NEW ORLEANS, MANDEVILLE, LA.

The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.).

Entered at the Post Office at New York, N. Y., as mail matter of the second class.

Subscriptions including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free: United States, Mexico and Canada, $6.00. Foreign countries, not including daily editions, $8.00. When paid through the London office £1.15.0. Single copies, 25 cents each, or 1s.

Railway Age

Vol. 80, No. 25 May 22, 1926 Table of Contents Appears on Page 5 of Advertising Section

Is a Labor Shortage Imminent?

AFTER an absence of several years reports of labor shortages among maintenance of way forces are appearing from several directions. While conditions are not yet acute these reports may be the forerunners of more serious shortages when the season's construction programs on the highways and elsewhere, as well as on the railways, get in full swing. Because of this fact, this development deserves the attention of every railway officer with any considerable amount of construction or maintenance work in prospect. The appearance of a labor shortage should not be unexpected. Rather it is the logical result of the curtailment of immigration that has been in effect during the last two or three years. For years the railways and many other industries recruited their extra gangs or temporary labor from newly arrived immigrants. With the reduction in the number of these men entering the country and the constant depletion of the ranks of those already here by their graduation into semi-skilled and skilled trades, it is inevitable that a scarcity in the supply of unskilled labor should develop sooner or later. The realization of this fact by those men who have concerned themselves with the future has stimulated the use of labor-saving equipment and has led in many instances to the utilization of this equipment where no immediate economy was in prospect. Another development which has been stimulated by the approach of a scarcity of labor has been the increasing attention given to the extension of the working season and the growth of the amount of work done during the winter months, as a result of which not a few roads already have such a large part of their important work already completed that they are largely independent of any shortage that may develop this year. In spite of the marked improvements in the conservation of labor that have been made by many roads, there are other roads on which no such improvements have been made and which still endeavor to handle their work by sheer force of numbers during a season of short duration. It is on such roads that the effects of a shortage of labor, if it develops this year, will be most felt. Whether a shortage develops this year or not the threat of it will have a constructive effect by stimulating the more efficient use of the labor that is available. A labor shortage may after all be beneficial by reason of the results it produces.

Good Service Records and Their Basis

WHAT information can be gained from a clear service record? Everybody knows, of course, that an engineman, for example, may have such a record by accident. He may have escaped a collision by sheer good luck; may have done the act to cause a disaster which did not happen because something intervened to prevent it. But there is another kind of luck; sometimes shortsightedly called good luck. In a collision at Newark, Ga., reported not long ago by the Interstate Commerce Commission, the engineman at fault had been in service 43 years and his record was reported as "clear;" yet he had habitually neglected the rule to show his train orders to his fireman. Was this man habitually overbearing toward inferiors? If he was, the inspector ought to have noticed it. And this fireman; he had a clear record of 23 years; yet he neglected the rule about reading train orders because, evidently, he lacked the courage to take measures for the safety of his train when he feared the displeasure of his boss. What was his clear record good for? Other cases like this may be found frequently in the government records. The only way for a trainmaster to decide intelligently that an engineman or a conductor is fully entitled to be graded "first class" is to watch his conduct all of the time. The trainmaster who says that he can never find time to do such watching may perhaps have a plausible excuse which will be accepted by his superior, but if he neglects *any* opportunity to check conduct as regards *all rules*, the excuse will fail to satisfy his own conscience, whatever may be the reaction of the superintendent to it. It is one of the cold facts of real life that enginemen of 43 years' standing are found sometimes to be lax in their observance of rules. Possibly this may arise from an unconscious vanity over a long-continued immunity. One trainmaster, commenting on government records like those mentioned said: "I guess we have been devoting too much time to higher education;" in other words, discussing puzzles about the construction of rules—perhaps the rules least used—while neglecting the enforcement of fundamental requirements. Take the simple matter of requiring that meet orders be read by firemen and brakemen; enforce the rule or cut it out of the book. A proposal to cut it out would bring the issue into daylight, where it would receive better attention. If it is retained, and the attempt is made to have it always observed, why not furnish separate copies of orders for these men? Is not that the logical next step?

Where Freight Business Is Growing

THE freight traffic statistics of the railways show strikingly how much more rapidly natural resources are being developed and business is growing in the southeast than in any other part of the country. In the first three months of this year, the freight traffic of the western roads showed an increase of about one per cent over last year, that of the eastern lines seven per cent and that of the southern lines, including those in the Pocahontas coal district, over twelve per cent. When the comparison is carried back some years, the facts developed become even more striking. The freight business of the railways in each of the large territories exceeded all previous records in 1920. Since then its growth has been remarkably unequal. In the first three months of the present year, the freight business of the western lines was seven per cent less than in the first three months of 1920, while that of

the eastern lines was seven per cent greater, and that of the southern railways about 29 per cent greater. The most remarkable increase in traffic has been on the railways of the Pocahontas region in which most of the non-union coal mines are located. Because of the inability of the unionized bituminous mines in most parts of the country to compete with the non-union mines, there has been a vast increase in the output of the latter, which is reflected in an increase since 1923, of about 50 per cent in the total freight business of the railways in the Pocahontas region. This great increase in the business of these railways largely accounts for the failure of the traffic of the railways in union coal mine territory to increase normally. Even in southern territory, outside of the Pocahontas region, however, freight business now averages about 20 per cent greater than it did in 1920. There is an extremely wide spread between the decline of about seven per cent during the last six years in the freight business of the western lines and the increase of almost 30 per cent in traffic in southeastern territory. It is doubtful if there ever has been since the Civil War, a period when the difference between the rates of development in the south and in the west has been so great as during the last six years. The west will have to begin again to make the investment of capital in western territory attractive, if its development is to begin again to rival that of the south. The Goodings, Brookharts, LaFollettes, Pitmans, Wheelers and Norrises, and such organizations as the Non-Partisan League and the Intermediate Rate Association, have advertised the woes and political and economic vagaries of the west too much. Progress and prosperity will return to the west when it begins to treat its railways fairly and to solve its economic problems at home instead of sending haranguing demagogues to Washington to solve them.

What Price Bus Rides?

NO more important question faces a railroad planning the operation of motor buses than that of the rate of fare to be charged by the buses. The question is important because it may well mean the difference between profitable and unprofitable bus operation, because it will affect the interchangeability of tickets on buses and trains and in consequence the degree of co-ordination of rail and highway service and because it may mean the creation of or the failure to create a substantial amount of new business. The Motor Transport Section in this issue contains an article describing the bus operations of the Great Northern through its subsidiary, the Northland Transportation Company. The basic rates of fare charged by the Northland are 2.75 cents per mile on buses operating on paved roads and three cents per mile on buses operating on unpaved roads. These are rates substantially less than the 3.6 cents per mile rate which is standard for transportation on railway trains. There is an even greater difference between these rates and the rate of four cents per mile which is widely recommended by experienced operators of motor buses. As explained in the article on its operations, the Northland has fixed such a low rate because it has been felt that only with such low rates can it expect to attract business from the private motor car, which its tests have shown to be the principal source of its bus passenger traffic. In other words, the Northland feels that it can create so much more business with its low rates than it could if it charged a rate of 3.6 cents or 4 cents per mile that in the long run it will earn more.

A majority of the roads now operating motor buses charge the same rate, 3.6 cents per mile on the buses that is charged on trains, making tickets completely interchangeable. Others charge more for rides on their buses than on their trains because of the belief that the greater convenience and availability offered by the motor buses render the higher charge equitable.

The question to be decided by railroads operating or planning the operation of motor buses is: Which is better—to charge a low rate which may be expected to create a large amount of business, to charge the standard rail rate which will make possible the interchangeability of tickets, or to charge a higher rate, which is not excessive but which will result in a return from each passenger more nearly commensurate with the added convenience furnished him? The results obtained by the roads which adopt these different plans for fixing rates for bus transportation will be watched with keenest interest. The question is an open one upon which local conditions will have an important bearing and which experience alone can answer definitely and accurately.

Need for Co-operation on Railway Policies

THE numerous railways of this country differ greatly in their physical, operating, traffic and financial conditions and in their relations with the public that they serve and the employees who work for them. They compete actively in service and for traffic. They have some real antagonistic interests, and some the antagonism between which is more seeming than real.

They have also important problems that are common to them all. The same general policy of regulation is applied to them, and they will rise or fall together according to what this general policy is made by public sentiment. They have much the same labor problems, although some deal more largely with labor unions than others.

Prior to some fifteen or sixteen years ago there was little conference and co-operative action among railway managers regarding their common problems. The American Railway Association has a long record of useful work, but it used to fail regularly in periods of large traffic movements to get the railways to co-operate fairly, effectively and in accordance with their car service rules in the movement and distribution of freight cars. A hostile public sentiment had developed, and was resulting in more and more restrictive regulation which was reducing the earning capacity of the railways, arresting their development and threatening the destruction of private ownership.

Railway managers saw that they must become better organized for conference, discussion and common defense if the carriers were not to be ruined. Therefore, the Railway Executives' Advisory Committee, which subsequently became the Association of Railway Executives, was organized. This association has had four chairmen of great ability, the late Frank Trumbull, the late Thomas DeWitt Cuyler, Hale Holden and R. H. Aishton, who have rendered distinguished service to the railroad industry. Some years before government operation was adopted the association undertook the vastly important work of harmonizing the views of railway managers regarding regulation and of embodying the consensus of their opinions in a legislative program for presentation to Congress and the public. It was, we believe, on its initiative that the Newlands Committee of Congress to investigate the entire subject of railway regulation was appointed. The association, on behalf of the railways, presented to this com-

mittee a definite program at hearings which attracted widespread attention and exerted much influence on the attitude of Congress and the public.

Government operation was adopted before these hearings were finished. The Association of Railway Executives rendered a very important service in helping shape the railroad control legislation adopted and in dealing with the Railroad Administration regarding various matters while it was operating the railways.

Happily, before government control was terminated there came into existence, partly owing to the work that had been done by the association prior to government control, and partly owing to the results of government operation, a public sentiment which was favorable to the return of the railways to private operation under constructive legislation. There were differences of opinion among railway executives regarding the legislation needed, and especially regarding the provisions concerning rate-making and the recapture of "excess" earnings. The Transportation Act has been, however, conceded by most railway managers to be the best regulatory law ever enacted; and its framing and adoption were largely due to the conference and co-operation of the railway managers through the Association of Railway Executives.

Likewise, the strengthening of the Car Service Division of the American Railway Association and the resulting improvement in the distribution and use of freight cars has been due to the same increase in co-operation. The program adopted and announced at the meetings of the American Railway Association and the Association of Railway Executives in April, 1923, for a concerted drive by the railways for the investment of capital and the increase of operating efficiency required to enable them satisfactorily to handle the country's commerce has been productive of splendid results down to the present time.

While there have been many differences of opinion among the executives concerning the things the Association of Railway Executives should do and not do, most of these have not been serious enough to prevent it from effectively presenting the railroads' case to Congress and the public and getting beneficial results. Ever since the railways were returned to private operation, however, there has been one class of questions upon which the executives have found it difficult or impossible to agree. These have been labor questions. Their differences regarding the establishment of national boards of adjustment were so great that they withdrew from the association authority to deal with labor matters.

When, several months ago, it seemed desirable to some of them for negotiations to be carried on with the railway labor leaders to ascertain if an agreement could be reached with them regarding labor legislation a committee of the association became the agency for carrying on these negotiations. The outcome was that the railways became split into a majority and a minority faction. The former supported the Watson-Parker bill and spokesmen for the Association of Railway Executives appeared for it before committees of Congress. The minority openly and energetically opposed it. The opposing arguments of the two sides not only showed the public that the railways disagreed, but caused much confusion in the minds of public men, business men and farmers as to what it was desirable to do and as to whether railway executives were trying to get regulation which was fair and compatible with the public interest. Whatever may be the effect of what has been said and done upon relations with the employees, the effect upon public sentiment has been unfavorable.

Every large group of business interests in the country is organized into some national association to promote its welfare. Because of the regulation to which they are subjected the railways peculiarly require such an organization. There is hardly a day passes on which there is not started in or out of Congress some project for regulation which might become dangerous if not given careful analysis and intelligent discussion. The study and discussion of these projects cannot be effectively carried on by officers of individual railways acting independently. They demand study, conference and agreement by men representing the various railways and the presentation of the results of their study and deliberations by persons who can speak authoritatively for all of them. If there were not already such an organization as the Association of Railway Executives every railway officer who considered the situation on its merits would recognize the need for forming one. The railways can formulate sound policies regarding matters affecting all of them only by conference and further them only by organized effort.

The executive officers of the railways are very able men, and, as is likely to be true of such men, are strong individualists. They are naturally prone in conferences and outside of them to be greatly influenced by what they consider to be in the interest of the properties they represent. The impartial observer is likely, nevertheless, to find it difficult to understand some of the differences that arise between them regarding questions that affect all the railways. For example, just why they split as they did on the Watson-Parker bill is inexplicable. Almost anybody in the railroad business would have predicted that if they did split some of those who were found in each camp would be found in the opposite camp.

Perhaps the true explanation is that the proposed legislation was not given adequate consideration and discussion at meetings of all the executives either before or after a tentative agreement was made with the labor leaders. The proposed legislation was of very great importance to the railways. Support of it required a change of the attitude of a large majority of executives who for years had defended the labor provisions of the Transportation Act. Nevertheless, the time devoted to its consideration and discussion by the railway executives before the majority voted to agree to it was only a fraction of the time given to hearings on and discussions of the bill by Congress.

There will be many occasions in future when it will be desirable for the railway executives to confer and, if possible, agree if they are to avoid having policies none of them want forced upon them by people who can agree. They will continue to be confronted with proposals for changes in regulation, with demands for changes in wages and working conditions, and with competition from other means of transportation which may be fostered by public subsidies or lack of regulation. Regardless of the responsibility for it, the way they have recently dealt with the question of labor legislation affords a capital example of the way in which important questions affecting all the railways should not be dealt with. It does not show or tend to show that some such organization as the Association of Railway Executives should not exist. On the contrary, it indicates that better organization for the purpose of bringing about conferences, discussions and agreements concerning matters in which all the railways are vitally interested are needed, and that more time, thought and patience should be devoted to formulating policies on behalf of the entire railroad industry.

There must always be a high degree of individualism in the management of the various railway properties, but there will always also be need for the subordination and pooling of individual views and for co-operative action regarding the numerous important matters in which the railways have a common interest. The worse they pull together regarding these matters the worse it will be for each of them, while the better they pull together regarding them the better it will be for each of them.

Getting Automobile Owners as Railroad Passengers

ON April 25 with the coming into effect of its spring timetable the Boston & Maine inaugurated what is probably the most comprehensive program of speeding up trains undertaken by a railroad in many years. The road operates 660 trains each day and practically all of these had their schedules quickened—some by only a minute or two, to be sure, but in many cases by a more substantial figure.

The Boston & Maine, as is generally known, operates in a territory which is covered throughout with improved highways. Morever, distances between centers of population are short—the average passenger ride is only 20.06 miles. All conditions, therefore, are favorable to competition by private automobile and this competition, with some by independent bus operators, brought a loss in passengers carried from 1921 to 1925 of 22.9 per cent.

The situation, clearly, was serious. However, there was some evidence pointing to a possible remedy. Last summer the road operated a number of low rate excursions and found, by questioning, that many of the passengers handled on these excursions were automobile owners. They had, they said, been attracted to the railroad excursions by the reasonable cost and the opportunity afforded to get somewhere where they wanted to go quickly and without being exposed to the inconvenience of driving on congested highways—clear evidence, in other words, that it was possible, under certain conditions, to attract an automobile owner to the railroad for a short ride.

Another bit of evidence—and this still more to the point—was the increase in railroad traffic between Boston and Portland following the placing in service of a single fast named train, the "Pine Tree Limited." Traffic on this route has gained 10 per cent since this train began to run last fall, whereas the decline continued elsewhere on the system. A saving in time and somewhat more attractive equipment, together with the favorable publicity which the innovation brought, were sufficient to attract traffic to the railroad without the inducement, as in the case with the excursions, of lower rates.

Following the suggestions offered by this experience, the railroad decided to quicken its schedules generally, to put on additional fast trains with better equipment, and to lay out a program of increased excursion services for the coming season.

A general quickening in schedules can, however, be decided upon much easier than it can be put into effect. In the first place, some improvement was possible by the relatively high state of maintenance to which the motive power had been brought, but it was realized that the elimination of train stops would have to be the main source of improvement. This involved in some cases the substitution of motor bus service on the highways; in others, for various reasons, no substitute service was necessary.

Details of this program are given in an article in the Motor Transport Section on another page of this issue. It is an example of what can be done by co-ordinating highway and railway transportation to give a service impossible to a company operating on the highway or the railway alone.

The road's program is an excellent instance—of which there are many all over the continent—of a tendency which someone has termed the "Railroad Renaissance." This term, rebirth or re-awakening, however, carries the implication of previous death or sleep, which is obviously an overstatement. At the same time it cannot be denied that the roads have shown greater vigor in increasing their efficiency and in improving their service since they have had a chance to forget the dark days of government operation. And as fine a proof of public appreciation of such accomplishment as could easily be found was the treatment, news and editorial, given to the Boston & Maine's improved service in the press of the territory it serves.

Valuation for Recapture

AN argument of great interest and importance will be held before the entire Interstate Commerce Commission on June 23 on the proposed report by Examiner J. Paul Kelley outlining a method of ascertaining "valuation for recapture purposes" under section 15a of the Interstate Commerce Act, pending the completion of the valuations on which the commission has been working ever since 1914, by "less thorough processes" than those contemplated by section 19a, the valuation act.

This method is outlined in the report of findings recommended to be made by the commission in the case of the St. Louis & O'Fallon and the Manufacturers' Railway. The fact that the argument is to be heard by the entire commission indicates that this is to be treated as a test case for the establishment of precedents to govern the findings in the numerous other excess income cases on the commission's docket, or perhaps to go through the courts for the purpose of finding out whether the commission may collect half of a carrier's net income above 6 per cent before completing its valuation.

Although the Transportation Act was passed six years ago only a few million dollars have thus far been recaptured because most roads have not even had a fair return during that time and also because of the absence of valuations for the years in which some roads are thought to have earned excess incomes.

For the purpose of making the recapture provisions "workable" the Kelley report proposes a short-cut method of using the valuation data which had not even reached the stage of a tentative valuation report and produces a value as of 1919, based on 1914 prices, which is then readjusted to 1923 by a consideration of net additional investment. The report not only admits that this is done without giving any weight to the increase in prices but contains an argument against any consideration of the cost of reproduction in the determination of value, and refers to the result as the "probable, necessary, reasonable investment remaining in the property." This basis is not only used as the "value for recapture purposes" but it is also asserted that this is the same as value "for rate-making purposes."

In the statement of exceptions to the report, filed by the attorneys for the two roads, it is asserted that it is based in this respect on the minority opinion of the Supreme Court in the Southwestern Bell Telephone case, which emphasized "prudent investment" as a fair basis of value; but in many places in the report the language used would seem to indicate that the examiner had invented his own law to suit his purpose. If the railroads are to be valued for either rate-making or recapture purposes according to what the commission, with the help of its examiners, may decide would be a fair amount on which they should be allowed to earn a return on general principles, or on an estimate of what they ought to have cost instead of what they have, a great many millions of dollars and many years have been wasted in taking inventories for the purpose of giving the result some appearance of an ascertainment of value.

It is sometimes argued that, since the roads are "enjoying" rates based on the tentative "short-cut" aggre-

gate valuation made in 1920, they ought to be willing to figure excess earnings on a similarly rough basis. However, the very purpose of an excess income investigation is presumably to test or correct, as to the individual road, the results of the application of the aggregate valuation, and a much more thorough and exact ascertainment is necessary to determine whether an individual road is or should be "enjoying" the rates thus made to such an unreasonable extent that it should not keep what it makes from them.

Savings Effected by Reduction of Stocks

HOW large stocks of fuel, materials and supplies should railways carry? The stocks on hand at the end of the three years 1914, 1915, and 1916 averaged 12.6 per cent of the total operating expenses in those years. The Bureau of Valuation of the Interstate Commerce Commission, on this basis, estimated that the stocks carried should be about 10 per cent of annual operating expenses because part of them are carried for additions and betterment work and part are obsolete. It was pointed out in an editorial in these columns last week that it is arbitrary and unjust to take an average for all the railways and conclude that any railway whose statistics show its stock on hand is greater in proportion to its operating expenses than this average is carrying excessive supplies. The stock that any railway needs to carry depends largely on its special conditions.

And, anyway, why use as a measure of the efficiency and economy of the purchases and stores departments the ratios of the stocks on hand to total operating expenses? On the average wages constitute about 60 per cent of operating expenses. There is no relationship apparent between the stocks that should be carried and the wages paid.

It would seem that a better statistical measure to be used would be the ratio of the stock on hand to the total expenditures made for the fuel, materials and supplies used during the year. Unfortunately, no such statistical measure can be arrived at for the railways as a whole. The approximate amounts charged to operating expenses by the Class I roads for fuel, materials and supplies in the years 1916 to 1924 inclusive, are shown in statistics compiled by the Bureau of Railway Economics. The value of the stocks carried by the Class I roads at the end of each of these years is also known, but the statistics are not strictly comparable because part of the stocks reported are carried for use in additions and betterments work. However, comparisons of the figures will tend to show whether the trend of stocks carried in proportion to the amount of them used currently is upward or downward.

The accompanying table shows that at the end of 1916 the ratio of stocks on hand to total operating expenditures for fuel, materials and supplies and miscellaneous in that year was 40.4 per cent. The ratio had increased at the end of 1917 to 50 per cent. This apparently is the highest figure reached during the last ten years. In 1922 it had declined to a minimum of 32.7 per cent. In 1924 it was 35.7 per cent.

The statistics plainly show certain tendencies. One of these is for stocks to increase in years when railway earnings increase and to decline when earnings decline. Total earnings in each of the years 1917, 1918, 1920 and 1923 were larger than in the immediately preceding year; and the total stock on hand at the end of each of these years was larger than at its beginning. In 1919, 1921 and 1924 both total earnings and total stocks on hand declined. The only year of the period in which earnings and stocks on hand did not increase or decline together was 1922. This general accord between the trends of total earnings and stocks on hand evidently is due to the policy of most railway managements of sharply reducing purchases when earnings decline.

Year	Operating expenditures for fuel, materials and supplies and miscel.	Stocks on hand at end of year	Ratio to year's operating expenditures for fuel, etc.
1916	$801,458,839	$323,556,387	40.4
1917	1,005,505,427	502,986,042	50.0
1918	1,321,912,991	630,207,210*	47.7
1919	1,475,822,765	597,573,735*	40.5
1920	2,041,475,114	755,563,278	37.0
1921	1,657,624,510	665,147,099	40.1
1922	1,668,772,754	546,284,853	32.7
1923	1,895,187,617	682,725,812	36.0
1924	1,569,592,933	560,048,899	35.7

*Estimated for Class I railways in years of government operation on basis of stocks held by all railways as shown by statistics of Interstate Commerce Commission.

The second and most important general tendency indicated by the statistics is that of the stocks carried to decline in proportion to the operating expenditures made annually for fuel and materials and supplies. In the first three years of the period the average ratio of stocks on hand to operating expenditures for fuel and materials and supplies was about 46 per cent, in the next period of three years about 39 per cent, and in the three years ending with 1924 less than 35 per cent. These figures show there has been an increase in the rapidity with which stocks have been turned over.

This has resulted in substantial savings. It has been estimated that the annual cost of carrying fuel, materials and supplies is from 16 to 25 per cent of the investment represented by the stocks carried. The average investment represented by the stocks carried during the three years ending in 1924 was about $596,000,000. If the ratio of this figure to annual operating expenditures for fuel, materials and supplies, instead of being about 35 per cent, as it actually was, had been about 46 per cent, as it was in the three years 1916 to 1918, the average investment in stocks on hand would have been $787,000,000 or $191,000,000 more than it was. Sixteen per cent upon this difference would have been $30,560,000, and 25 per cent upon it would have been $47,750,000; and these figures indicate roughly the annual saving that has been made by the reduction in the stocks carried and the increase in the rapidity with which they are turned over. At the end of 1917 the stocks on hand apparently represented a six months' supply. During the last three years they have represented about a four months' supply.

The facts show that the railways, like other business concerns, have been profiting by reducing their inventories.

New Books

Mainsprings of Men, by Whiting Williams. 313 *pages,* 5½ *in. x* 8¼ *in. Bound in cloth. Published by Charles Scribner's Sons, New York. Price* $1.50.

Many books on the "labor problem" are published. Most of them are of little value because they show the writers do not really know the problems, sentiments and point of view of either the employer, on the one hand, or the employee, on the other. Most of them are more or less partisan presentations from the standpoint either of "capital" or "labor." There is need for more literature written by men who fully understand the problems and sentiments of both employers and working men, and which, whether

read by employer or employee, will tend to promote a better feeling and understanding between them.

One of the best books ever written by a man who does understand the problems, sentiments and aspirations of both employer and employee is "Mainsprings of Men" by Whiting Williams.

Mr. Williams began a good many years ago to do personnel work for a concern that was a large employer. He seems to have found that the main obstacle encountered by him was that he did not know what actually was in the minds and hearts of working people. He decided to find this out in a very simple and sure way. He left his desk, let his beard and moustache grow, put on overalls and got a job as a common laborer. He has worked as a common laborer in shops and coal mines for months at a time in the United States and in various countries of Europe. When thus employed he has lived in the same boarding houses, slept on the same kind of beds and eaten the same fare as his fellow laborers. He has adopted their modes of speech, participated in their home life and talked with them about all the things they and their families have had on their minds.

After periods of such employment he has emerged from the ranks and worked for periods as a consultant on personnel matters for various large concerns, including some railroads.

Most executives and officials of large railroad and industrial companies in America have "come up from the ranks." They believe they know what is on the working man's mind, but they often deceive themselves. Usually a good many years have elapsed since they have been promoted from the ranks to the positions they now hold. During these years they have forgotten much of what they had on their minds when they were working men. They may think they have not, but they usually have.

Mr. Williams, by the method he has adopted, has given himself the great advantage, when he has advised or written regarding personnel work, of being so fresh from living the daily life of the working man that he has not had time to forget what really are the working man's aspirations, his information, his attitude toward his labor leaders, toward his foreman and the employment relationship. He has written several books about what is on the working man's mind based upon his experience and observations. "Mainsprings of Men" is the latest of them, and it is a classic of labor literature.

There is a line of constructive discussion of the labor problem running through it, but what is on the working man's mind is developed page by page and chapter by chapter by the quotation of what working men all over the world and in various kinds of industries have said in their own vernacular. In consequence, it is not a dry treatise but is as interesting as a novel. It portrays the working man, whether he be a common laborer or a skilled mechanic, not merely as a part of a huge industrial machine, but as a living, breathing, striving, thinking, dreaming human being who wants to be well regarded by his fellow men, who loves his children and wants them to have a chance in life, and who above all things, perhaps, wants to gain and keep the respect of his neighbors and his class by showing them that he is a worthy person.

Every man who has to deal with labor or who presumes to discuss the relations between employer and employee should be interested and benefited by reading this book. It is not partisan in any sense regarding any question. Its value consists in the fact that Mr. Williams has put positive genius into an effort to make all classes of the people engaged in industry, from the heads of big concerns down to those who dig in ditches, better understand each other and their relations with each other.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Culleh, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

The American Labor Year Book 1926, by Labor Research Dept., Rand School of Social Science. Directory of railroad workers' organizations, p. 101-102, 105-114, giving officials, and activities during past year. See also Index under "Railroad." 571 p. Pub. by Rand School of Social Science, New York City, $3.

Decisions 1925, by U. S. Railroad Labor Board. Decisions Nos. 2774-4000 [v. 6], with addenda and interpretations, and Appendix showing regulations and orders of the Board together with Court decisions on Title III, Transportation Act 1920. 1491 p. Pub. by Govt. Print. Off., Washington, D. C.

Facts and Figures of the Automobile Industry, 1926 Edition, by National Automobile Chamber of Commerce. Common carrier bus operations, p. 30-31, by States; steam railroad use of motor vehicles, p. 36-37; use of buses on Great Northern, p. 33; New Haven, p. 33; Lehigh Valley, p. 42-43; rail mileage abandonment, p. 44; analysis of motor truck traffic, p. 45. 96 p. Pub. by National Automobile Chamber of Commerce, New York City. Apply.

Waterways Versus Railways, by Harold G. Moulton. Revised edition. Author's preface to revised edition outlining important developments since 1912, p. ix-xvii. 468 p. Pub. by Houghton, Mifflin, Boston, Mass., $2.50.

Periodical Articles

Bureaucracy Triumphant—Government by Commission at Washington, by Silas Bent. What has happened to transportation in the 100 years between Fitch's steamboat and the establishment of the Interstate Commerce Commission, and what has happened since, p. 180-184. Century, June 1926, p. 180-189.

Democracy's Flat Tire, by Chester T. Crowell. On the slowness of democracies to make decisions. Results on railroad regulation, p. 207-208. Century, June 1926, p. 203-212.

Government Action to Speed Prosperity of Weaker Rails, by George B. Collingwood. What reduction of interest on government loans would do for carriers. Magazine of Wall Street, May 8, 1925, p. 32-33, 81.

Operation of the Air Mail and Its Possible Application, by J. E. Whitbeck. Recruiting and training personnel, operating experiences, field construction, etc. Mechanical Engineering, May 1926, p. 465-467.

Our Railroads Still Compete, by Robert S. Henry. Map shows 170 possible routes between Louisville and Jacksonville. Illustration is reproduction of Pennell's etching of the Lackawanna Viaduct "built to save 20 minutes running time between New York and Buffalo." Nation's Business, issue of May 1926, p. 55, 58, 60.

Where the Public Succeeds. Editorial comment on Canadian National Railways in 1926, and extension of Baltimore & Ohio plan. New Republic, May 12, 1926, p. 346-347.

Electric Power and the Railroads, by A. H. Armstrong. On the advantages of electrification. General Electric Review, May, 1926, p. 301-304.

Recapture of Railroad Earnings, by John Balch Blood. Savings Bank Journal, May, 1926, p. 40-42.

THE MUTUAL BENEFICIAL ASSOCIATION of Pennsylvania Railroad employees has just completed a two months' campaign to increase its membership, and the total number has been raised 25 per cent to above 18,000. The association now consists of 69 local assemblies and has investments amounting to over $700,000. Insurance has been written for employee members to the amount of over $9,000,000. Local assembly No. 70 at Columbus, Ohio, received a prize of five shares of Pennsylvania Railroad stock for turning in the largest number of new applications.

Three Types of Movable Bridge Spans—At the Right is a Strauss Bascule Span Which Replaced the Swing Span Over Which the Train is Passing. In the Rear is a Vertical Lift Highway Span

Florida East Coast Completes St. Johns River Bridge

Many difficult problems imposed in both substructure and superstructure work

By P. P. Pierce

Assostant Engineer, Florida East Coast, Jacksonville, Fla.

THE St. Johns River bridge which the Florida East Coast recently completed at Jacksonville, Fla., merits more than usual attention because of the methods employed in its construction. The entire substructure was built by the pneumatic process and all but one truss span and many of the girder spans forming the superstructure were delivered into position and set in place by means of barges.

The present structure replaces a single-track bridge, portions of which were constructed in 1889 by the Jacksonville Bridge Company and later acquired by the Florida East Coast. This original structure consisted of one 320-ft. rim-bearing swing draw, with one 250-ft. through truss span to the north and three similar truss spans to the south of the swing span, with timber trestle approaches on each end, the total length of the bridge being 2,652.7 ft. George S. Morrison was the designer of both substructure and superstructure.

With the exception of the pivot pier at the swing span, which comprised a 28-ft. steel cylinder, all piers were composed of two cylinders 10 ft. in diameter, connected at the top by a diaphragm made up of angles and plates. These cylinders were lowered in most cases by the open excavation method, but the casings were so constructed that a horizontal diaphragm could be introduced and the pier sunk as a pneumatic caisson. This was found necessary in a number of cases on account of the very uneven surface of the bed rock.

Due to the depth of water, which is 65 ft. south of the draw, the truss spans were erected on falsework at a conveniently located dock down stream from the bridge site, then loaded on barges and floated into their proper locations. This was one of the first floating bridge operations ever attempted in this country.

Trestle Approaches Replaced in 1915-1916

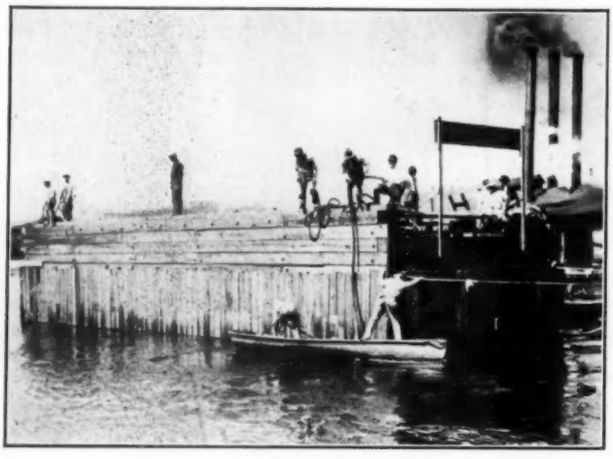
In 1915-16 the timber trestle approach on the south end was replaced by three 50-ft. deck girder spans, eleven 70-ft. spans of deck girders and one 70-ft. through girder span. For foundations, oblong steel casings with rounded ends 7 ft. by 16 ft. overall were lowered as far as possible by interior excavation. Twenty-six green pine foundation piles were then driven to refusal and the casing filled to the proper elevation with concrete. At this same time the north approach, which was very short, was reconstructed and the timber pile trestle replaced with concrete piles, concrete caps and 20-in. 85-lb. I beam spans, the bents being 16 ft. center to center.

As time passed and the loading which the structure had to carry was increased, the trusses were reinforced to care

for the increased stresses. However, after a period of over 35 years of service, traffic had increased to such an extent that a single track was inadequate to take care of the business and it was decided to replace the old structure with a double-track bridge.

The New Bridge

After a thorough study of the numerous conditions a plan was approved which called for a bridge 2,451 ft. long with two tracks, spaced 13 ft. center to center, the center line of the new bridge being 6½ ft. upstream from the center of the old structure. No change in grade could be made owing to the fact that 300 ft. north of the north abutment a viaduct carrying a street across the tracks affords a minimum of clearance. Furthermore, the elevations of grade crossings on the south bank of the river could not be changed. The new bridge embraces 26 piers and 2 abutments, all constructed by the pneumatic method. The superstructure consists of a north approach of two 50-ft. and three 70-ft. deck girder spans and one 216-ft. through truss span; a 216-ft. Strauss single-leaf heel-trunnion bascule span with a 120-ft. machinery span; and a south approach of two 216-ft. through truss spans, one 55-ft. through girder span and fourteen 70-ft. and two 50-ft. deck girder spans. The clear height of the truss spans above mean low water is 6½ ft. and that for the girder spans averages 4 ft. except in the case of the 55-ft. through girder, span, where it is 9 ft. This span was introduced to permit the passage of the smaller boats without opening the bascule span. In designing the structure, Cooper's E-55 loading was used for the fixed spans and Steinman's M-46 for the movable span.



Floating Out One of the Caissons

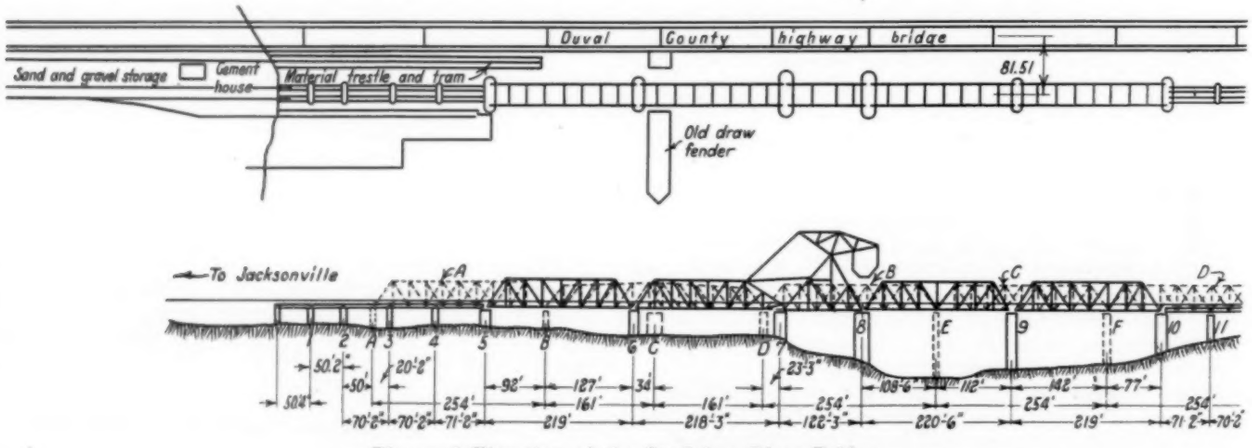
Substructure Work Started Late in 1923

The contract for the substructure was awarded to the Union Bridge & Construction Company of Kansas City, Mo., which was represented on the work by E. M. Philpot, vice-president; L. C. Beattie, engineer; W. O. Duckworth, superintendent and Lou Greble, pneumatic superintendent. In September, 1923, a material yard was established on the south bank of the stream and the work of assembling material and equipment was begun.

Local conditions made it necessary to do most of the work with floating equipment and as the local supply of barges was inadequate and unsuitable for this class of work, all of the barges used were built and equipped by the contractor's forces. This equipment or fleet consisted of the following:

1 large compressor plant, equipped with three boilers.
1 5400-cu. ft. Sargent air compressor.
1 high-pressure compressor for air motor boring machines and hammers.
1 high-pressure 6-in. force pump.
1 hospital lock.
An electric light plant and other necessary machinery.
1 one-cubic yard mixing plant.
3 derrick barges.
1 pile driver barge.
6 material barges.
2 small coal barges.
Numerous small pontoons for working floats.
The hull of a stern wheel river steamer, purchased and rigged up for quarters for "pneumatic sinking" forces.
A local tug, chartered to do the necessary towing.

For the piers in the shallower water, a pressure plant, practically a duplicate in equipment of the floating compressor barge, was erected in the material yard on the south bank and pipes laid on the existing structure, with outlets at the necessary points. A 20-ton locomotive crane was supplied for use in the material yard.



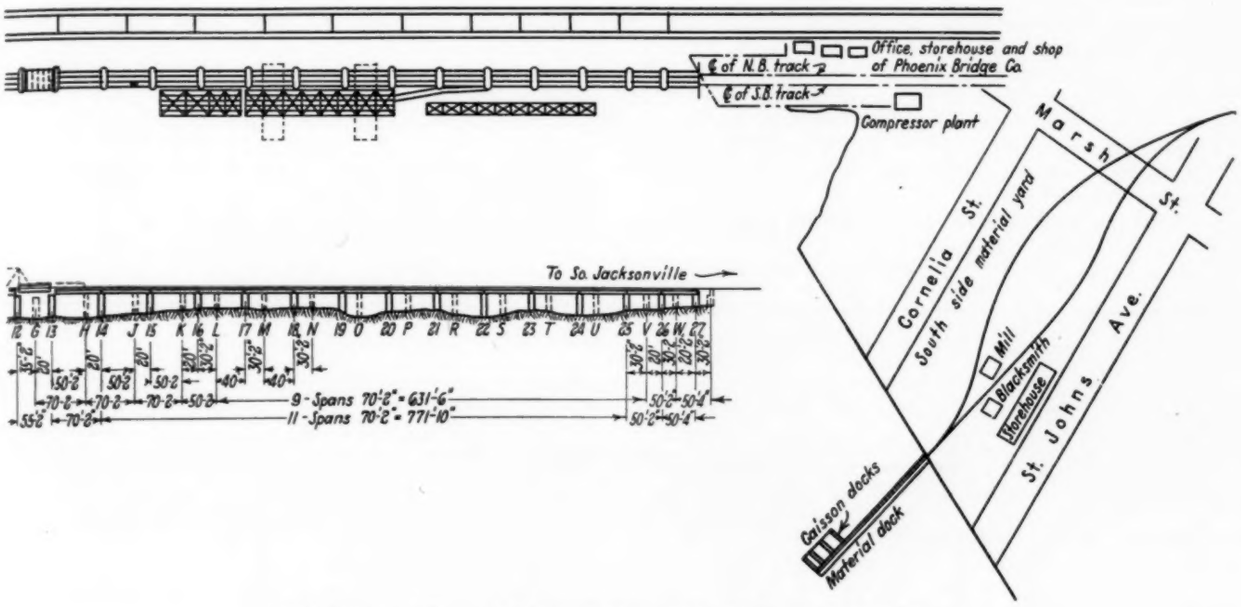
Plan and Elevation of the St. Johns River Bridge

How the Caissons Were Built

At the south side material yard three docks, one for the purpose of handling material and two for the building of caissons were constructed. Double bents, separated the necessary distance, were driven and capped, and from these, stringers were suspended by means of lowering screws 20 ft. in length. The cutting edges of the caisson were laid on these stringers and the caisson built up to a height of 12 to 15 ft., after which the caisson was

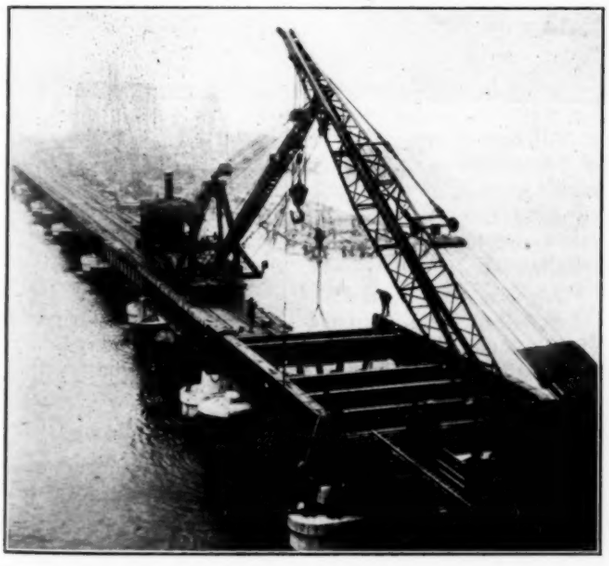
launched by turning down the lowering screws until it floated out of the dock. The lowering screws were then turned up until the stringers were in the original position ready for the construction of a new caisson.

The caissons varied in size from 12 ft. 8½ in. by 33 ft. 9 in., for the smaller piers, to 28 ft. 5 in. by 70 ft. 5 in.



Old Structure Shown in Dotted Lines, New Structure in Full Lines

for the larger piers. When ready, the caissons were towed out and anchored to large "Chinese" or concrete anchors upstream from their definite location where concreting and building up of the sides were carried on



Erecting the New 55-ft. Through Girder Span on Piers 12 and 13, Falsework for Erecting Truss Spans in the Background

alternately, until the cutting edge was only a short distance above the bed of the stream. The caisson was then placed in its exact location under the old structure by means of the anchor lines and sufficient weight added by concreting to land it on the bed of the stream.

This feature was one of the most delicate and hazardous operations on the entire work for a number of reasons among which were: (1) Limited headroom under the old structure; (2) the depth of water, ranging up to 65 ft.; (3) the tide, which at times, with the wind in the right quarter, runs seven to eight miles an hour; (4) the exposed position, which with a westerly wind not only increases the tidal flow, but kicks up a choppy, nasty sea; (5) a very heavy under-tow on both ebb and flood tide, and (6) the difficulty in finding proper anchorage in the muddy bed of the stream. The height of the caisson cribbing above the water was at all times such that if one should by any chance get adrift, it would pass underneath the old structure. To prevent canting or listing of the caisson, caused by the undertow, before placing it in position U-bolts were placed at the corners about eight feet above the cutting edge, and anchor cables were brought up through them to the top, to be handled in the same manner as the top anchor cables. On the piers in the deeper water, where tidal pressure is greater, U-bolts were placed at intermediate points and cables brought up in a similar manner. Due to the importance of the anchorage a special crew was assigned to look after the cables at all times.

The smaller caissons had one 33-in. main shaft and one 24-in. supply shaft with a bucket lock. The larger ones were equipped with one 33-in. main shaft and two 24-in. supply shafts with bucket locks. A rather novel method was used in the construction of the abutments. A caisson was sunk for each abutment in a manner similar to that employed on the piers and was constructed similarly except that at each end of the caisson near each corner one-half of a "Lackawanna" steel sheet pile was added, connected to the caisson by angles. After portions of the abutment within the crib had been constructed above the water line, steel sheet piling were joined to the halves on the caisson and a cofferdam of sufficient size driven to enable the construction of the wing walls to proceed.

Encounter Uneven Rock Surface

The excavated material consisted of mud, sand, shell and rock with the usual amount of timber and debris

commonly encountered in river beds. The rock encountered was a sand shell limestone, varying from soft to hard. Unlike other rock, it was filled with pot holes, as they are locally termed, or large cavities. In some instances, one-half of the cutting edge of a caisson would be on solid rock and the remainder over a mud-filled cavity varying from 2 to 10 ft. in depth. In other places the rock and muddy sand lay in strata and it was necessary to make certain that the excavation was carried to solid rock for a satisfactory foundation. Borings were carried ahead of all excavation in order to be informed at all times of the conditions to be encountered. After the caisson had landed on a good foundation, the working chamber was sealed with a mixture of 1:2:4 concrete and the air pressure slightly reduced and allowed to stay on for a period of from 10 to 12 hours.

Above the deck or roof of the working chamber, a slab of 1:2:4 concrete varying in thickness from 2 ft. for the smaller caissons to 5 ft. for the larger ones, was placed. a large part of the material was unloaded directly from car to barge without additional handling.

Dimensions of Piers Vary

The piers are rectangular in section at the base and at convenient points, varying with the size of the pier and the depth of water, the larger piers were stepped in to give the ends a half octagonal section and again to a cylindrical nosing at a point 12.5 ft. below mean low water for the larger piers and 4 ft. below for the smaller ones. The piers vary in size from 7 ft. by 29 ft. for the smaller to 16.5 ft. by 58.5 ft. for the larger ones. All piers have a batter of ½ in. to the foot under the coping.

The depths of the piers cover a wide range, increasing abruptly between Piers 7 and 8 and decreasing almost as abruptly between Piers 10 and 11. With mean low water considered as Elevation 100, the base of Pier 7 is at Elevation 68.17; Pier 8 at Elevation 10.2; Pier 9 at Elevation 5.0; Pier 10 at Elevation 25.6 and Pier 11 at Elevation 62.93. The elevations of the remaining foundations vary roughly from 65.3 at Pier 12 to 80.4 at Pier 3, the shallowest.

Floating the First New 216-ft. Span Into Position. Temporary 108-ft. Span is Seen at the Right Background. Temporary 70-ft. Span in the Left Foreground

From this point up to a point four feet below mean low water the mixture was 1:2½:5, while from this elevation to the top of the pier, a 1:2:4 mixture was used. Slump tests were taken at frequent intervals and a number of test cylinders made for each pier which showed a uniform strength throughout the whole work.

The 28-day tests of 6-in. by 12-in. cylinders showed an average of 2,200 lb. per sq. in. for 1:2:4 concrete and 1,750 lb. per sq. in. for 1:2½:5 concrete. "Coosa" cement from Ragland, Ala., was used throughout and the aggregates were gravel from near Montgomery, Ala., and a clean uniformly graded white sand from Edgar, Fla.

A storage yard for concrete materials and a cement house were constructed on the north bank of the river adjacent to the railway tracks to relieve the congestion in the south side material yard. Furthermore, all of this material coming into Jacksonville over other roads could be handled at this point, thereby saving the hauling of the loads across the bridge and the return of the empty cars. This yard was served by a traveling derrick which could load either into or out of both sand and gravel bins. A trestle for handling cars with a tram truck alongside was built out to water sufficiently deep for a loaded barge and

Air was placed on Caisson 5, the first one to be constructed, at noon, January 1, 1924. Pier 6, the last one, was completed on November 3, 1924, or 10 months later. This is thought to be a record time for the construction of 28 piers by the pneumatic process.

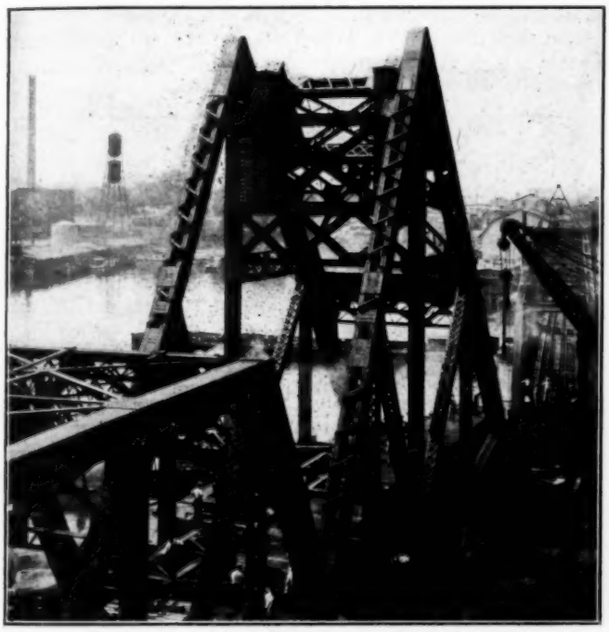
Work on the Superstructure Followed

The contract for the erection of the superstructure, including the material and its fabrication, was awarded to the Phoenix Bridge Company, of Phoenixville, Pa. The equipment employed on the work consisted of the following:

A 60-ton locomotive crane.
A 40-ton derrick car.
A compressor plant located on shore from which air was piped to all of the bridge south of and including the bascule span.
A blacksmith and machine shop.
A 30-ton floating derrick, also equipped with centrifugal pumps.
A floating pile driver.
A pump barge, equipped with pulsometer pumps and an air compressor for use on the spans north of the bascule span.

Barges, chartered as needed for the floating operations and for handling material.
A stiff leg derrick, a guy derrick and a "jinny wink," used in erecting the lift span.

Work was started on the south girder spans, the first one being set in place on September 25, 1924. These spans were received riveted up, and were set in position by the crane and derrick car from the old bridge at periods when sufficient time for the operation could be secured between trains. On November 3, 1924, traffic was routed over the new girder spans from Pier 14 to the south end of the bridge and the old girder spans were shifted longitudinally from the old piers to their new location on the



Floating the Machinery Span Into Place, Old Swing Span Partly Open in the Background

new piers, where they were repaired and repainted before traffic was rerouted over them on December 8.

On December 10, 1924, old through truss Span D, 250 ft. in length, was floated from its position on three barges. Blocking of proper height was placed on the barges into which water was pumped until their decks were barely out of water. After being placed under the span they were pumped out, raising the old span from the piers and when sufficient clearance was gained it was towed out and landed on falsework especially prepared for it. Before the floating operation, the old span was reinforced to prevent any sagging or buckling.

This span was replaced in part by a temporary 70-ft. deck girder span, one end of which rested on Pier 10, the other being supported by a cross girder between the two cylinders forming old Pier F. In addition, two permanent 70-ft. deck girder spans were erected to span between Piers 10 and 11 and between Piers 11 and 12, while a 50-ft. deck girder span was placed to span from Pier 12 to falsework near Pier 13. This made it necessary to remove two panels of the floor system from the old 70-ft. through girder span supported on old Piers G and H, the 50-ft. deck span fitting in between the girders of the through span.

Trusses Erected in Temporary Location

While the foregoing operations were being carried out, falsework was driven alongside the south end of the bridge and a trestle connecting this falsework with the southbound main track was constructed. When completed this falsework was used for the erection of a 216-ft. through truss span. At the same time the old 250-ft. span which was removed on December 10 was remodeled into an 108-ft. truss for use to span the openings between the old and new work, as will be explained later.

At 10 a.m. on January 31, 1925, traffic was stopped and the temporary 70-ft. deck girder span between Pier 10 and old Pier F was removed; the derrick car and crane placing it on a barge after which it was tied up at its permanent position between Piers 10 and 11. Barges were placed under the old 250-ft. Span C, which rested on old Piers E and F, pumped out and as soon as the span cleared the old piers at 11:45 a.m., it was towed out and tied up at the falsework where it was to be dismantled. Then the temporary 108-ft. truss span which had been previously placed on barges was towed in between new Pier 9 and the old pier E, scuttled and the span allowed to settle on its bearings. Following this, the new 216-ft. through truss span, which had been floated from its position on the falsework the day previous, was towed in between Piers 9 and 10 and allowed to settle on its permanent bearings. The track was connected up and the first train passed over at 4 p.m. The time consumed in this operation was six hours.

The next floating operation took place on March 4 when traffic was discontinued at 9:47 a.m. Barges placed under old Span B between old Piers D and E were pumped out and as soon as the span cleared the piers it was towed to falsework where it was later landed for dismantling. The temporary 108-ft. span on Piers 9 and E was next floated out and placed between Piers 7 and 8. Temporary timber bents were also placed on Pier 7 and Pier D with I beams to form a temporary span in the gap between these two piers. Another new 216-ft. span which had been erected on the falsework and placed on barges the previous day was then towed in, the barges scuttled and the span allowed to settle on its permanent bearings on Piers 8 and 9. Rail connections were made and the first train passed over at 5.23 p.m. One and one-half hours were lost due to the velocity of the ebb tide.

After this operation the erecting falsework was rearranged and the 120-ft. machinery span was erected thereon. The span, which is practically of the same weight as the 216-ft. spans, was placed on barges and floated into its final position between Piers 7 and 8 on April 29, 1925, in place of the temporary 108-ft. span which had been previously floated out and towed to the falsework. Traffic was stopped at 1 p.m. and resumed at 4:30 p.m.

Work on the North Approach

On May 6, 1925, two 50-ft. deck girder spans were placed to span from the north abutment to Pier 1 and from Pier 1 to Pier 2. Traffic was suspended at 10:15 a.m. and resumed at 3 p.m. This operation necessitated the removal of the north approach trestle, made up of 32-ft. 20-in. I-beams supported by concrete pile bents. The concrete piles, which were precast, were very heavily reinforced and difficulty was encountered in dynamiting them successfully. The spans for the southbound track were placed later without interruption to traffic.

On August 4, 1925, traffic was suspended at 8:30 a.m. and the old 250-ft. Span A which had been previously jacked up and placed on rollers was rolled in the clear. The actual time required to roll the span 40 ft. was four minutes. The remainder of the concrete trestle was also removed at this time. The gap thus made between Piers 2 and B was filled as follows: A 70-ft. deck girder span was placed on Piers 2 and 3 by a derrick car, 70-ft. deck

girder spans were floated between Piers 3 to 4 and Piers 4 to 5, and landed in permanent position; three panels of the floor system of the new 216-ft. through truss span to be erected north of the new draw were placed and bolted up on falsework driven between Piers 5 and B; and temporary cribbing was placed between the south pier beam and old Pier B. Track was replaced and traffic resumed at 4:25 p.m., the time consumed by the operation being 7 hours and 55 min.

How the Bascule Span Was Erected

During these operations work was going ahead steadily on the counterweight, the counterweight truss and the erection of the bascule leaf, which was erected in the open position, one floor beam and one panel of stringers being left out on the trunnion end to permit the passage of trains. The position of the counterweights during construction made it necessary that the trains be operated around a 15-deg. reverse curve in order to pass from the single-track on the draw span to an exactly centered location between the counterweights which hang inside the trusses of the machinery span.

One of the most difficult operations was the raising and placing of one of the lower chord members of the counterweight truss, which with the 42½-in. counterweight bearing-pin weighing 16 tons made a total weight of 56 tons. This load had to be lifted to a position 75 ft. above the track. A stiff-leg derrick of 25 tons capacity was erected on top of the machinery span which handled the upper end of the member, while the 60-ton locomotive crane was used for the lower end. As the load was raised and the member became more nearly vertical the crane moved ahead under its own power, this being made possible by blocking the outriggers on rollers. The remainder of the counterweight truss as well as the connecting links were also erected by the crane and stiff-leg derrick. The operating struts, weighing 32 tons, were erected by the crane on one end and an outrigger block and fall line. The first two panels of the bascule leaf were erected by the locomotive crane and the remaining panels by a guy derrick which was stepped up as the work proceeded. Ties and rails were placed and fastened in the open position and all parts made ready for the use of the span as soon as it was lowered. While the erection of the bascule was in progress, the counterweight was being concreted and the machinery, furnished by the Earle Gear & Machinery Company of Philadelphia, Pa., was being installed by the bridge company and the electrical equipment was installed by the Norwood-Noonan Company of Chicago.

Putting the Bascule Span in Service

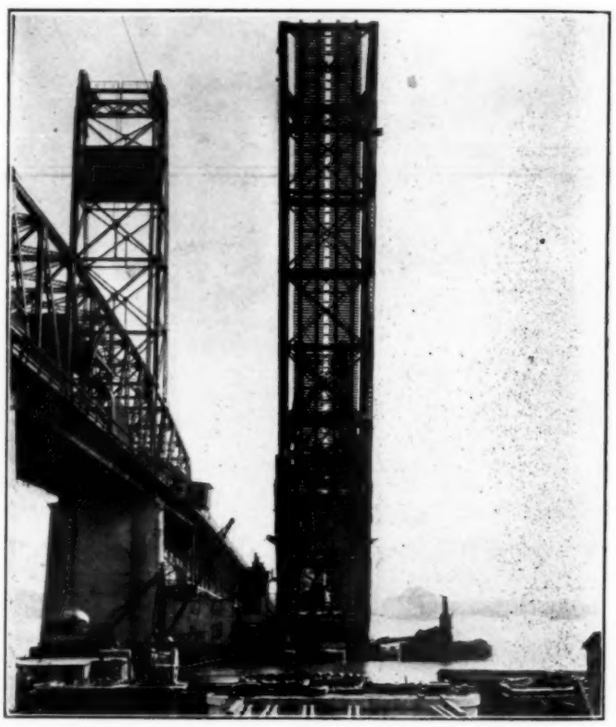
On November 23, 1925, the channel was closed to river traffic, the machinery on the old swing span was dismantled and all preparations completed for the removal of this span. At 6 a.m. on November 24 traffic was held up and pumping was begun on the barges that had been scuttled under the old draw span. As soon as the span cleared the piers it was floated out and towed to the falsework prepared for it.

In the meantime a crane placed the floor beam and stringers which had been left out of the first panel of the bascule span and the laterals between the counterweights. The derrick barge was used to place and bolt up that part of the floor system north of the 216-ft. through truss span which lies between Piers B and 6, the trusses for this span being later erected on falsework under traffic. Unfortunately, the pumping out of the barges on the old draw span had to be done on a falling tide which delayed the operation. As a result traffic was not resumed until 8:45 p.m.

Following this operation, work proceeded on the erection of the trusses on the north 216-ft. span. The southbound track was completed and traffic routed over it for the first time at 6 p.m., December 12. The span was riveted up and finally swung on December 24, after which the falsework was removed.

The work of the removal of the old piers has progressed as the old piers were released for demolition. The War department requires all piers to be removed to a depth of 35 ft. below mean low water. The steel shells of the old piers were of sufficient size and strength to be used as cofferdams in removing the concrete; when the required depth was reached dynamite was used to blow them off. The piling in the piers on the south end of the old structure were cut off with dynamite after the concrete and shells had been removed.

The bascule leaf will be interlocked with automatic signals which are being installed by the General Railway Signal Company. The Phoenix Bridge Company forces worked directly under Clyde MacCornack, chief engineer and general manager, and W. H. Shoemaker, general superintendent, who were represented at the site of work by H. B. Orcutt, resident engineer, and J. F. Kinter, superintendent.



Getting Ready to Lower the Bascule Span for the First Time

The entire operation was under the supervision of H. N. Rodenbaugh, vice-president and general manager, and H. M. Brown, structural engineer. Major C. R. Fickes* was directly in charge of the work, assisted by H. B. Anderson, H. Wickle, H. G. Shafferman as cost accountant, and the writer.

*Who has since died at Jacksonville on February 8.

THE GRADE CROSSING LAWS of New York have been modified by Chapter 833 of the laws of this year, signed by the governor on May 13, so as to provide that the Transit Commission shall not order the elevation of a railroad running longitudinally in a street without the concurrent approval of the local municipal authorities.

Valuation for Recapture Purposes

Question of what constitutes a "single system" and "short-cut" method of valuation to be argued before I. C. C.

WASHINGTON, D. C.

METHODS of ascertaining railroad value for recapture purposes proposed by Examiner J. Paul Kelley of the Interstate Commerce Commission in the cases involving the ascertainment of excess income of the St. Louis & O'Fallon and the Manufacturers' Railway, are vigorously assailed in a statement of exceptions to the report filed by Clark & La Roe, attorneys for the two railroads. The case is to be argued before the entire commission on June 23 and is regarded as of special importance because the methods finally adopted by the commission in this case would naturally be applied to the large number of other cases in which the commission has instituted proceedings to ascertain whether roads have recapturable excess income above 6 per cent on their value. Also it is expected that whatever decision is finally reached may be taken through the courts. The statement of exceptions also objects to the finding that the two roads, which are controlled by the Adolphus Busch estate, are not operated as a single system.

The commission is asked to find: "That the carriers are under common management and control and are operated as a single system; that the values of the properties as of recapture periods predicated upon 1914 prices are not in conformity with the requirements of law; that the true values as of the time of inquiry must be determined, and that the said values are in substantial conformity with the minimum values claimed by the carriers and abundantly supported by evidence of record submitted by both bureau and carrier witnesses."

A brief quotation from the statement was published in the *Railway Age* of May 15. Some additional extracts from the discussion of the issues involved, first considering the question of system operation, with which most of the roads are concerned, and then the proposed method of valuation, are as follows:

The Question of System Operation

Under the definite provisions of section 15a of the interstate commerce act, one part of a system of railroads commonly owned, controlled and operated may not lawfully be required to contribute a part of its earnings to other carriers or systems when to do so would leave another part of the system with insufficient earnings or no earnings at all. Computation of system earnings must be for the system as a whole and the provision is obviously essential to avoid the probability of confiscatory results.

In the present case the examiner proposes that earnings from one part of the system, indispensably necessary to give the owners a fair return on the commonly owned, managed and operated system, shall be paid into a contingent fund for the benefit of other railroads and their owners. It is proposed that the other part of the system, which has suffered enormous deficits and is now earning only a meager return, shall be permitted to perish or, in the alternative, to operate at less than a reasonable return and perhaps at a loss. If its unprofitable operation shall continue—within the period covered by this record it has never earned a reasonable return—it may be permitted to borrow from the contingent fund and incur interest obligations for the use of money earned by another part of the system. Thereby its burden is merely increased and the injustice of such an alternative is patent.

The examiner cites no authority, legislative, executive or judicial, for the untenable theory advanced with respect to system operation. There is no such authority. A mere opinion, doubtless influenced by the fact that the parts of the system are separately named, is father to the idea. The authorities, completely overlooked by the examiner notwithstanding the numerous citations upon brief, are clear and explicit and there is no conflict of judicial expression.

Exception is taken to each and every finding and conclusion appearing in the proposed report of the value and values of respondents' properties as of June 30, 1919, and as of December 31 of each of the years 1920, 1921, 1922 and 1923, and to each and every finding, holding or conclusion therein stated, that respondent Saint Louis & O'Fallon Railway Company is liable or subject to have part of its net railway operating income in the years from 1920 to 1923, both inclusive, recovered from it as income in excess of a fair return on the value of the railway property held for and used by it in the service of transportation.

There is no disposition on the part of the owners of these properties to avoid any obligation placed upon them by the law. They are ready and willing to meet any obligation legally imposed upon them by the statute. They contend, however, and there is no authority to the contrary, that Congress manifestly intended that each part of the system shall be preserved. It was not intended that the owners should be required to operate one part of the system at a loss or at a return that is less than reasonable. It was not intended that they should have a reasonable return on one part of the system only, with no return on the remaining part.

In the hearings before the committees of Congress preceding enactment of the 1920 legislation, where reference is made to excess earnings, competition or competing carriers are generally referred to in the same connection. Reference to prosperous and less prosperous competitors is generally associated with the subject of excess earnings. The parts of a railroad system do not and can not compete against each other in the sense in which the term competition is used in the law and in the testimony and debates preceding its enactment. Inasmuch as the traffic of the several parts of a railroad system cannot be competitive as between the different parts of the system, and inasmuch as constitutional guarantees must be observed, it was quite logical that Congress should provide for computation of the aggregate net railway operating income of a group of carriers under common control and management, notwithstanding separate accounting returns may be made for the various parts of the system. That is identically the situation here presented.

Operations of the St. Louis lines have been conducted at enormous losses and even now under rates fixed by the commission only a meager net income is produced. Operations of the O'Fallon lines have been reasonably profitable, not because of competitive advantages, but by reason of location and availability of tonnage, and the income from that part of the system has enabled the common owners to preserve and continue in operation the St. Louis lines. Can it now be said that the St. Louis lines should be forced to operate at less than a reasonable return or at a loss, and that at the same time amounts earned by the O'Fallon line, necessary to make good the deficits, shall be recaptured by the government? Such a proposition is manifestly unjust. It violates the definite language of the statute, it is contrary to the spirit and purpose of the law, and its enforcement would be plainly unconstitutional.

The manifest intent of the act is to give the *owners* of the railways a fair return and to prevent the diversion of their business from the weak roads to competitors. *Dayton Goose Creek Ry. Co. v. United States, supra.* That is one of the considerations by which the court was guided in upholding the constitutionality of the provisions challenged in the case cited. It is obviously a controlling consideration for, if the Congress should undertake to deprive these owners of an opportunity to earn enough to maintain their properties and equipment, if it should deny the right to a fair return, the act would plainly violate constitutional requirements.

These carriers are under common control and management. They are operated as a single system. Their owners are entitled as a matter of constitutional right to a reasonable return. They can not be compelled to take a loss on one part of the system and surrender a profit from the other part. Their legal rights can not be restricted to a reasonable return on only one part of their transportation system. They are plainly entitled to a reasonable return on the aggregate fair value of the property as a unit. It is perfectly clear that the prime object of the act is to provide a reasonable return to the owners of railroad properties devoted to public use, to insure the continued existence of weak lines such as the Manufacturers, to insure for a group of carriers under common control and management and therefore non-competing a computation for "the system as a whole." That interpreta-

tion and construction is in complete harmony with the intent of Congress and with constitutional requirements. The conclusion suggested by the examiner fails to stand the test of interpretation or of construction and, if adopted, would violate constitutional provisions.

The examiner finds that the distance between the railroad of the O'Fallon and that of the Manufacturers is about 12 miles. He should have said that the distance is about 12 miles via the present route and connections. The very definite intent and purpose to make direct connection between these roads is made clear on the record and is evidenced by the acquisition and holding by the O'Fallon of 30 acres of land for terminal purposes near the eastern approach of the bridge which will be used as soon as the railroad approaches thereto are completed. Pending the completion of the bridge and the direct physical connection between these two roads, that connection is effected through and over the connecting tracks of the Terminal Association.

The owners and managers of these respondent roads devised a plan for definitely merging them into one. The plan was approved by the directors and by the stockholders. The president of the companies came to Washington to submit to the commission the plan and to get some information and suggestions relative to procedure. He was told that it would be idle to bring forward such a proposition at that time and that it would have to await final adoption of a plan for consolidation of railways. This fact is definite evidence, just as the arrangement preliminary to completion of the municipal bridge is definite evidence of the fact that these properties are not only operated as a single system but are treated as a unit.

Procedure Followed in Proposed Report Is Contrary to Law

The conclusions reached in the proposed report are to the effect that proceedings *hereafter* may be instituted against respondent O'Fallon to "recover" excess income of it, but that no recapture proceedings should be instituted against respondent Manufacturers Railway Company. The proceedings complained of being purely valuation proceedings, the exceptions thereto are that they are not in due and orderly form, are not in accord with the statute, and generally that they are illegal and contrary to law.

It is impossible to read into paragraph (4) of section 15a of the act any authority to the commission to determine, from time to time, and as often as may be necessary, and by the best methods available to it, the value of the property of individual carriers. This paragraph deals with the finding of "aggregate value of the property of the carriers," and it is this "aggregate value" which may be determined from time to time, and as often as may be necessary. A provision for the finding of some sort of "aggregate value" at an early date was essential to the prompt enforcement of the rate-making provisions of section 15a of the act, and the commission heretofore, in Ex Parte 74, exercised the power here conferred upon it to determine as best it could the "aggregate value" of carrier property, both as a whole and by groups, and established schedules of rates based thereon. The necessity for changing the "aggregate value" so found will arise when, and as often as may be made necessary, by the findings of the commission under section 19a of the act, the value of the properties of individual carriers is determined. As these findings of value under section 19a of individual carrier's properties substantially increase or decrease the "aggregate value" found in Ex Parte 74, the same will be due to be changed.

The proposed report announces that:

> The Commission is not bound in this proceeding by the processes or the results of the valuation under section 19a,

thereby announcing complete rejection, for the purposes of recapture, of the value of the property of these respondents as finally ascertained under section 19a of the act. This announcement is alone sufficient to condemn the entire report.

The proposed report states that "values for rate-making and recapture purposes are the same." If the correctness of this statement as an abstract proposition be granted, it is to be pointed out that neither in the case of these respondents, nor of any other carrier, is the value for rate-making and recapture purposes the same under the provisions of section 15a of the act. The value on which rate schedules for these respondents are based is not the value of their properties, but is the "aggregate value" of the properties of all carriers in the group in which respondents' properties are located. On the other hand, the value of the properties of respondents to be used for recapture purposes must be the value of the properties held for and used by them in the service of transportation, and the act so directs. The rates for respondents, therefore, are based on one value, but any recovery from them for excess income must be based on another value.

Rates based on "aggregate value" may be presumptively correct in a confiscation case brought by an individual carrier, but the presumption may be overcome by proof of the fact of the value of the property of the individual carrier. This was the distinct holding of the Supreme Court in the *Dayton-Goose Creek Case*, and in the *New England Divisions Case, supra*. In such an issue of confiscation it is immaterial whether the "aggregate value" on which the schedule of rates in controversy is based has been correctly determined. The issue is whether or not the prescribed rates are confiscatory of the value of the property of the interested carrier. To settle that issue the value of its property must be definitely and finally ascertained. It cannot be settled by reference to a mere temporary or tentative valuation of its properties. All rules for the protection of private property would be set at naught if there could be a taking of private property on a mere temporary finding of fact.

With reference to the general statement that value for rate-making and recapture purposes is the same, it is also to be pointed out that the properties of these respondents cannot have, at the same time, two separate and distinct values for rate-making purposes. The value authorized and directed to be found in section 19a of the interstate commerce act is there said to be the value which "shall be *prima facie* evidence of the value of the property in all proceedings under the act to regulate commerce as of the date of the fixing thereof." This language clearly includes proceedings for the recovery of excess net railway operating income, because provision for such proceedings is now a part of the interstate commerce act.

The proposed report states that the value it seeks to find under section 15a, and also the value authorized and required to be found under section 19a, are both values "for rate-making purposes." This being so, they should be the same, for, as has already been stated, there cannot be two separate and distinct values at the same time, of the same property, for the same purpose. When the proposed report, therefore, states that the commission in the pending proceeding is not bound by "the results of the valuation under section 19a," it means to say that it proposes to find a value for rate-making purposes under section 15a which may be different from the value of the same properties at the same time, and for the same purpose, found under section 19a.

Difference Between Methods of Finding Aggregate Value and Individual Value

Respondents point out the difference between preparing an "aggregate value" for the purpose of basing a general schedule of rates thereon, and the determination of the value of the property of an individual carrier for the purpose of taking away from such individual carrier a part of its net railway operating income, which is its private property.

Whatever may be the mistakes in the "aggregate value" upon which the general schedule of rates is based, such rates as has already been pointed out, may be later attacked by an individual carrier if confiscatory of the value of its property. In the case of recapture of so-called excess earnings, however, whatever the carrier yields up or is forced to give up is lost to it. Before anything can be taken from it, therefore, as excess income, the value of its property "as of the time of inquiry" must be finally and legally ascertained. Until that is done there is no basis for a proceeding against it for recapture purposes, much less a basis for actual recovery from it.

Section 15a of the act makes it certain that only net railway operating income *in excess* of a fair return on the value of the property can be recovered from any carrier, and the *fact* of such excess must be established before there can be a lawful proceeding to "recover" it. The determination of what constitutes excess income rests in large part upon the value of the property, and tha value cannot be left to chance or determined in any haphazard manner. The proposed report reciting that at the time of the institution of the pending proceedings and at the time of the hearing thereon no tentative valuation report under section 19a had been made, and that upon the issuance of such tentative valuation respondents will have the right under section 19a of the act to file a formal protest of all items therein and to have a hearing for the purpose of presenting evidence in support of the protest, all support for the pending proceedings disappears and such disappearance should be hastened by the statement in the proposed report that the values reached under section 15a are reached "under less thorough processes" than those reached under section 19a. Certainly it cannot be disputed that the processes under and by which private property is taken should be "thorough."

The attempt is made in the proposed report to justify the procedure adopted, upon the allegation that it is a procedure necessary to expedite the enforcement of the rate-making provisions of section 15a. The allegation is but an assertion and is not, nor can it be, supported by any facts. The proposed report recites that a valuation under section 15a can "be accomplished with greater facility and promptness than is required in a valuation under section 19a," but it is inconsistent with itself in this allegation, for it it further states that in determining value under section 15a the commission should observe the same principles of valuation as are applied under section 19a. If the same principles of valuation are observed in the two proceedings, there should be no greater

facility or promptness in the accomplishment of the one than of the other.

Under section 19a the cost of reproducing the properties as of the date of determination of value, and not as of some prior date, must be ascertained and reported. The proposed report does not comply with this requirement. Under the established rules of law the cost of reproducing the properties as of the date of the valuation must be given due and proper weight in the determination of the value of the properties. The proposed report gives no weight to such cost. It contains an argument against any consideration of the cost of reproduction in the determination of value. It makes the statement that if cost of reproduction is taken as the measure of value it would produce "a result that common sense and good conscience could not approve." The findings and conclusions in the report being thus in direct violation of the provisions of section 19a and also in direct violation of well established rules of law must be observed, it would follow that if the report is based upon the assumption that section 15a of the act gives to the commission arbitrary power to make any kind of rules it pleases for the determination of the value of railroad properties to be used as a basis for the recovery of excess income. Respondents point out that, for the reasons herein given, such assumption is not supported by anything to be found in section 15a or in any other section of the interstate commerce act, and they further point out that the determination of value, presenting a judicial question in the determination of which well established rules of law must be observed, it would follow that if section 15a of the act can properly be construed as conferring any such assumed arbitrary power on the commission to make its own rules for determining value in a recapture case it is in direct violation of the constitutional protection of private property, and is invalid.

Method of Valuation Followed Does Not Determine Value

The proposed report has at least the merit of clearness and directness in its statement of the method of determining value adopted and approved by it. There is no equivocation or cutting of corners in describing this method. The method does not purport to, nor does it, ascertain the value of the property as of the time of the inquiry. It purports to ascertain and report only the probable investment remaining in the property. No pretense is made that it determines the value of the properties of respondents in any one of the proposed recapture years.

The proceedings instituted are for the enforcement of the provisions of section 15a of the interstate commerce act, which provisions did not become a law until the year 1920. Admittedly respondents are not liable or subject to a recapture out of their 1919 earnings, and yet the proceedings, for some unexplained reason, first undertake to ascertain the value of the properties of respondents as of June 30, 1919. The proposed report, however, explains that what is therein reported as the reproduction costs of the property of respondent O'Fallon as of June 30, 1919, "more nearly represent the probable original cost of money outlay for the property, exclusive of lands, which the carrier was devoting to the service of the public on June 30, 1919, than its cost of reproduction at that particular time."

The report is explicit in the statement that what is therein reported as the value for rate-making purposes of the property of respondent O'Fallon devoted to common carrier service on June 30, 1919, exclusive of lands, is "the probable, necessary, reasonable *investment remaining in such property as of that date.*"

Whether the sum named be satisfactory or unsatisfactory we protest that neither the law nor the decisions of the courts afford any warrant for concluding that a certain estimated value is correct or incorrect because it represents or does not represent the estimated probable or improbable, necessary or unnecessary, reasonable or unreasonable, "investment remaining in" the property being valued.

The method of valuation adopted not only gives no consideration to the replacement cost of the properties of respondents in any one of the proposed recapture years, but does not even ascertain such replacement costs, although admitting that such costs were higher than those prevailing in the year 1914, which latter costs are nevertheless applied to the inventories of the properties, other than land, in each of the recapture years.

The proposed report, in its failure to ascertain and determine the value of the properties as of the recapture years, in its adoption of the probable remaining investment in the properties in preference to their value as of the time of the inquiry, and its refusal to ascertain and apply prices for labor, materials and money prevailing at the times of the inquiry in the ascertainment of the value of the properties as of those times, is so squarely and directly in conflict with the repeated decisions of the courts, and particularly those of the Supreme Court of the United States, that the mere statement of its conclusions and holdings is sufficient to cause its rejection.

It would be difficult to draw any distinction between what the report purports to ascertain and calls "the probable, necessary, reasonable investment" in the property, and what has elsewhere been called the "prudent investment" in the property, and it is a fair comment on the proposed report to say that it adopts and undertakes to apply the minority opinion in *Southwestern Bell Telephone Co. v. Public Service Commission,* reported in 262 U. S. 276, and rejects and declines to follow the majority opinion of the court in that case.

The proposed report equally ignores and declines to follow the Supreme Court in *Bluefield Waterworks Co. v. Public Service Commission,* 262 U. S. 679. The Court here directly rejects a figure of value arrived at "on the basis of actual cost less depreciation plus 10% for going value and $10,000 for working capital," saying that such valuation cannot be sustained because the court below "failed to give proper consideration to the higher cost of construction in 1920 over that of 1915 and before the war, and failed to give weight to cost of reproduction less depreciation on the basis of 1920 prices." These cases are late expressions of the Supreme Court. They are in accord with what the Supreme Court has always held.

Repeated decisions might be cited of the rejection by the Supreme Court of the method of valuation adopted in the proposed report.

Depreciation

The proposed report advises that "the age of the property and the engineers' appraisal are clear indications of a lessening in the service life of the property and of some consequent impairment of the original investment in the property." It seems unnecessary to here enter into any extended discussion of the subject of depreciation. It has been discussed so many times before the commission that further discussion could scarcely accomplish anything. Respondents desire to point out, however, that, fundamentally wrong as they believe the Commission's method for determining depreciation to be where value is attempted to be ascertained and where higher prices are applied than the investment prices, it is even more fundamentally wrong where only the investment cost of the properties is sought to be ascertained and considered as a basis for earnings. Certainly if the carriers of the country are to be permitted to earn a fair return only on the investment cost of their properties, less a theoretical depreciation which under no possible application of maintenance can be overcome, there would be no inducement to any one to invest money in a railroad property, for such property would inevitably be a losing proposition.

1914 Values Not 1923 Values

By numerous citations submitted in this proceeding, and disregarded by the examiner, the law of the case is abundantly shown. The principles are well settled and there is no conflict of pertinent authority. These railroads are a group of carriers "under common control and management and are operated as a single system." Their operations are conducted, like the operations of a single system are conducted, by common owners, executives, operating officers and other common employees. By the test of ordinary usage, by the application of "common sense," under simple rules of etymology and grammatical analysis, by resort to lexicography, and, of controlling importance, by reference to judicial interpretation and construction, the identical meaning is attained.

Inasmuch as the carriers are under common control and management and are operated as a single system, net railway operating income must be computed for the system as a whole. For the purpose of such computation it is quite apparent that the fair values as of the time of inquiry must be established. In the determination of such values the commission must recognize all of the law of the land for rate-making purposes and give due recogntion to all the law of the land relating to constitutional guarantees and limitations. It is too apparent to require argument that 1914 values are not 1923 values, and that a limitation of net returns in 1923 to the amount that would accrue under a fair percentage upon 1914 value would be contrary to the unanimous determination of judicial authority.

THE GEORGIA COURT OF APPEALS holds that, at a place where people are accustomed to cross a railroad track, which is also a place used by passengers boarding trains, and which is generally used by the public with the knowledge and consent of the railroad company, the company owes no duty to a person who is merely standing at such place by the side of the track while a train is passing, and who is not there to cross the track or board the train, to refrain from negligently allowing a lump of coal to fall from the train and rest upon the ground by the side of the track, so that, in moving away from proximity to the passing train, he stumbles over the coal and is thrown under the train and injured. —Holland v. Georgia, S. & F. (Ga.) 129 S. E. 302.

I. C. C. Orders Increased Price for Securities

WASHINGTON, D. C.

THE Interstate Commerce Commission, Division 4, in authorizing the Pennsylvania to assume obligation and liability in respect of $17,030,000 of 4½ per cent equipment trust certificates, has exercised its power to order an increase in the price at which they are to be sold. The Pennsylvania had arranged to sell the certificates to Kuhn, Loeb & Co., at 97 per cent of par and accrued dividends, but, on the ground that "it appears that the proposed price is somewhat below that of recent issues," the sale was authorized at not less than 97.2 per cent of par and accrued dividends, on which basis the average annual cost to the company will be approximately 4.90.

Incidentally the report involves another debate between Chairman Eastman and Commissioner Woodlock on the question of requiring competitive bids for the purchase of such issues. Commissioner Eastman dissented on the ground that the public is entitled to the best evidence that can be presented that maximum prices are being obtained and that there is no good reason why the marketing of such securities should be monopolized. He also said that there have been several cases where the activity of the commission's Bureau of Finance has resulted in a better price than was at first offered. Commissioner Woodlock, in a concurring opinion, replied to some extent to Mr. Eastman's opinion, opposing any attempts to impose such a change at this time.

Objections to the proposed sale were filed with the commission by George H. Stephenson, a stockholder who contended at the hearing that a more advantageous sale could be made pursuant to competitive bidding. Comparisons were also made at the hearing, the report says, between the proposed issue and other recent issues, and between the financial status of the applicant and that of other carriers with whose issues the comparisons were made. Because of the size of the property and its constant requirements for new capital, the applicant stressed the importance of dealing with established financial institutions having assured sources of capital in both good and bad times and having the ability to protect the issue after it had been disposed of to the public.

Commissioner Eastman in his dissenting opinion said in part:

In the purchase of equipment the usual practice of railroad companies is to secure competitive prices from car and locomotive companies of recognized standing, and the same practice is ordinarily followed in the purchase of supplies and other items of property. There are exceptions, but that is the general rule. When it comes to the sale of their own securities, however, railroad companies follow quite a different policy. They throw competition into the discard and grant monopolies to particular banking houses. Ordinarily this monopoly is conferred upon either Kuhn, Loeb & Co., or J. P. Morgan & Co. There are exceptions, but they prove the rule.

These banking houses are largely jobbers rather than retailers of securities, and in general they sell to other banking houses, which in turn distribute to investors. A considerable degree of power over these other banking houses is inherent in the situation. Because of this fact it is difficult to secure a full, frank and public discussion of prevailing practices in the marketing of railroad securities by those who are well equipped for such discussion. It is easy to secure a defense of these practices, but difficult, if not impossible, to obtain a proper public presentation of the other side.

Such study and thought as I have been able to give to the question, utilizing various sources of information, have brought me to the conclusion that prevailing practices in the marketing of railroad securities are in many respects unsound and unhealthy. I am tempted to say that the preference of monopoly to competition is un-American, but refrain because of the widespread abuse of that word. I have been willing, however, that the change to better practices should be a process of evolution rather than revolution, and therefore have been content for the present to advocate a resort to some form of competition, in place of monopoly, only in the case of such comparatively standardized forms of railroad securities of assured investment standing as equipment trust notes and certain classes of guaranteed terminal bonds. There is, in my judgment, clearly no good reason why the marketing of such securities, at least, should be monopolized.

I am further aware that recent prices obtained by railroad companies for such securities, even in the case of monopolistic sales, are apparently not open to a great deal of criticism. It is probable that the discussion of prevailing practices has had something to do with this; and certainly our own supervision has played a part. There have been several cases where the activity of our Bureau of Finance has resulted in a better price than was at first offered. But this, to my mind, is not an answer to the fundamental question at issue. We are entitled, and the public is entitled to the best evidence that can be presented that maximum prices are being obtained, and that evidence is not being produced. Such evidence will only be before us when we know the prices that more than one, and preferably several, possible purchasers of recognized standing are willing to pay. In such cases I believe that we are fully justified in presenting these alternatives to the applicant: (1) Sale to its chosen purchaser at a minimum price closely approximating the market level; or (2) if applicant is unwilling to adopt such an alternative, sale to the highest qualified bidder after competitive bids have been publicly advertised for and received. See my dissenting opinion in *New York Central Lines Equipment Trust of* 1925, 99 I. C. C. 121, 124. Some contend that we are without power to pursue this course, but I know of no better way of finding out than by putting it to the test.

For the above reasons, I am unable to accept the conclusions reached in this case by the majority.

Commissioner Woodlock, concurring, said:

In passing upon security issues by railroads, I conceive our main duty to be that of securing the lowest possible cost of capital to the issuing company. Whatever method of security sales will produce that result is, I take it, the method which should be approved by us. It is no part of our business under the law from which we derive our powers and responsibilities to undertake to regulate the distribution of railroad business among banking firms in the financial district, save in so far as such regulation may be clearly necessary to the main purpose in view. If there is any business in the world more highly competitive than the banking business in New York, I am unable at this moment to think of it. It is the essence of competition that somebody is successful as against somebody else. It is inevitably the result of competition that some are more continuously successful and upon a larger scale than others. Success of this sort does not necessarily imply unfairness on the part of a successful competitor, nor is the unsuccessful competitor necessarily the victim of injustice. Not merely we have no warrant under the law as it stands for an attempt to hinder such a process of competition, or to interfere with the results, but to make such an attempt would be to run counter to the spirit and the principle upon which business generally is conducted in this country. Whenever it shall clearly appear that competition is unfairly restricted in such a way as to involve a greater cost of money to the carriers issuing securities, or whenever it shall clearly appear that better results to the carriers will come from imposition of a radical change upon issuing methods, then it will be our duty to give effect so far as lies in our power to the necessary changes. It is because I am not convinced that, taking the investment market as a whole, with all its fluctuations and changes in conditions of supply and demand, a radical change in methods would give cheaper money to the carriers, that I am opposed to any attempts to impose such change at the present time.

The Pennsylvania represented that it is in need of additional equipment to meet demands upon its service and has arranged to acquire the following:

Description	Units	Approximate unit price	Approximate total cost
Mountain-type steam locomotives	200	$75,573	$15,114,576
50-ton automobile box cars	2,000	2,137	4,274,800
Steel passenger coaches	74	27,910	2,065,309
Steel passenger-baggage cars	7	28,467	199,267
Steel passenger-cafe cars	8	37,051	296,406
Steel electric motor cars	20	43,125	862,493
Steel baggage-express cars	125	12,497	1,562,159
Total			$24,375,010

In case the actual cost of the said equipment amounts to less than $24,375,010, additional railroad equipment may be acquired at such cost that the aggregate cost of all the trust equipment will be at least that sum.

Burlington Results in 1925

Has had increase in ton-mile earnings since 1916 *of but* 36 *per cent and little increase in traffic*

THE Chicago, Burlington & Quincy reported in 1925 net income after interest and other charges of $21,184,593, equivalent to $12.40 a share on the company's capital stock. The net income in 1924 was $21,899,829 or $12.81 a share. The Burlington continues to have no special difficulty in earning its 10 per cent dividends which total $17,083,785 but it is disconcerting to notice that the 1925 net income was the smallest with but two exceptions, namely 1922 and 1923, since as far back as 1915.

The really interesting feature about the Burlington is the manner in which one can use its operating and financial results as a text for a dissertation on the misfortunes of the Western carriers. The Burlington is, of course, in the central western region. Its control jointly by the Great Northern and the Northern Pacific give it, however, community of interest with the roads in the northwestern region. On the other hand, the Burlington has many conditions that differentiate it from the northwestern roads. These include, for instance, its large proportion of coal tonnage which originates in southern Illinois, its extremely large traffic in live stock or its interests in the more prosperous Southwest embodied in its control of the Colorado & Southern and through the latter in the Fort Worth & Denver City.

A Reason for Recapture

Several years ago the Burlington was one of the richest roads in the United States. So wealthy was it that whenever there was agitation on the part of its neighbor carriers for higher rates, one of the most important arguments against their case was that the Burlington was already extremely prosperous and would with the increased rates become even more wealthy. In other words, the case of the Burlington was one of the reasons why the Transportation Act contains provisions for recapture of excess earnings.

The Burlington did not do quite as well in 1925 as in 1924. The carriers of this country are supposed to be earning net railway operating income equivalent to 5¾ per cent of their value. The Interstate Commerce Commission's official tabulations show that the Burlington in 1924 had net railway operating income equivalent to but 4.8 per cent of its book value, inclusive of material and supplies and cash. No longer can a fear of Burlington super-prosperity be offered as an argument against a rate increase.

Only 36 Per Cent

Wherein has the change in the Burlington status come about? The story is told in a few words. It seems to lie almost entirely in one factor—the freight ton-mile earnings. Thus, the revenue per ton-mile of the railways of the United States as a whole in 1925 was 55 per cent greater than in the calendar year 1916. In the eastern district there was an increase of 72 per cent; in the southern district an increase of 49 per cent; in the western district an increase of 43 per cent but in the case of the Burlington the 1925 revenue per ton per mile was 0.965 cents as against 0.708 in 1916, and the amount of increase was but 36 per cent. Certainly an increase of but 36 per cent in the revenue per ton-mile is entirely out of line with the reduced buying power of the dollar that has taken place since 1916.

REVENUE PER TON-MILE

	1925 cents	1916 cents	Per cent of Increase
Eastern district	1.108	0.646	72
Southern district	0.926	0.622	49
Western district	1.196	0.836	43
United States	1.098	0.707	55
Chicago, Burlington & Quincy	0.965	0.708	36

Sometimes a railroad can succeed in compensating for decreased earnings per ton-mile by increased traffic or by increased traffic density. What are the facts with reference to the Burlington? First, the Burlington's 1925 revenue ton-miles were not as great as in 1917, 1918, 1920 or in 1923. They were 12½ per cent greater than in 1916—an increase of 12½ per cent in 10 years or an average annual increase over the ten-year period of but 1.25 per cent. The Burlington receives about 73 per cent of its total operating revenues from the carriage of freight. The revenue passenger-miles in 1925 were the lowest reported in an extended period of years. As compared with 1916 this was a decrease of 18½ per cent. The picture is completed by a comparison on the basis of traffic units—one passenger-mile being taken as equal to three freight ton-miles. The comparison shows that the equivalent traffic units of 1925 computed on this basis were 6 per cent greater than in 1916. Spread over a ten-year period this increase is so small as to be almost negligible. It is, therefore, apparent that the Burlington has had no increase in the traffic to compensate for its small increase in its ton-mile earnings.

Comparison with Pre-War Earnings

The comparison can be carried further. Thus, the best measure of the pre-war level of earnings is the standard return for operations during federal control, the average annual net railway operating income for the three years ended June 30, 1917. The Burlington's standard return was $33,390,080. The 1925 net railway operating income was $28,131,918, which was but 84 per cent of the

TABLE I. CHICAGO, BURLINGTON & QUINCY, OPERATING RESULTS, SELECTED ITEMS, 1916 TO 1925.

Year	Mileage	Revenue Ton Miles	Revenue Passenger Miles	Rev. per ton mile Cents	Total operating Revenues	Total operating Expenses	Net operating Revenues	Operating Ratio	Net Railway operating Income	Net after Charges	Net charges for additions and Betterments
1916	9,373	10,923,326,000	1,097,092,000	0.708	$109,191,204	$65,235,705	$43,955,500	59.74	.....	$32,994,726	.....
1917	**9,373**	**13,143,186,000**	**1,186,682,000**	**0.662**	122,342,707	78,632,344	43,710,363	64.27	.....	29,406,032	$19,321,973
1918	9,373	14,162,605,000	1,144,479,000	0.738	144,172,769	112,067,616	32,105,153	77.73	$25,089,199	22,792,500	12,434,969
1919	9,372	11,952,721,000	1,346,973,000	0.895	154,011,438	120,492,962	33,518,478	78.24	25,428,088	23,542,471	6,920,610
1920	9,390	14,130,364,000	1,314,984,000	0.932	185,270,768	164,017,388	21,253,380	88.52	8,100,104	22,924,364	14,738,485
1921	9,364	10,554,788,000	999,701,000	1.163	168,712,268	128,216,290	40,495,978	76.00	28,696,588	25,609,973	8,304,559
1922	9,364	11,754,596,000	941,748,000	1.033	164,916,471	126,777,703	38,138,767	76.87	25,152,174	20,261,488	**19,359,165**
1923	9,401	12,690,384,000	967,097,000	0.996	**171,270,661**	134,290,379	36,980,282	78.41	25,365,567	19,290,529	17,406,999
1924	9,407	12,287,748,000	909,302,000	0.975	162,674,878	119,958,734	42,716,144	73.74	28,742,112	21,899,829	9,537,772
1925	9,404	12,298,288,000	893,670,000	0.965	159,155,178	116,671,868	42,483,310	73.31	28,131,918	21,184,593	11,432,319

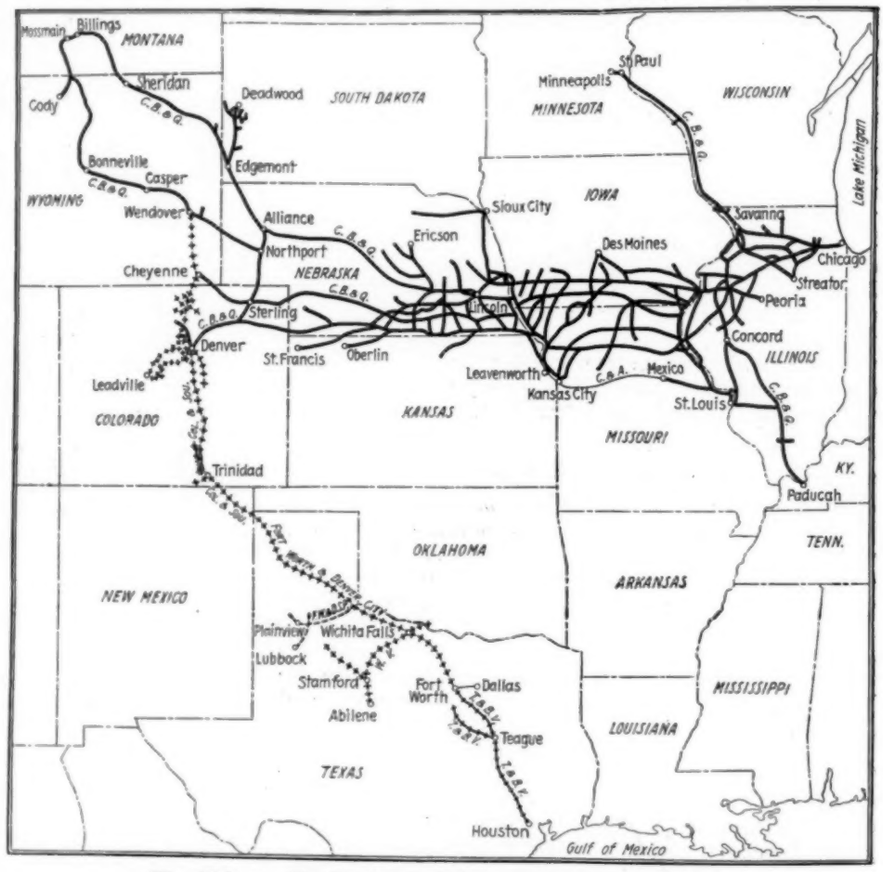
Standard return for operations during federal control or average net railway operating income for three years ending June 30, 1917—$33,390,080.

standard return. It is further disconcerting to note that although it was but 84 per cent, it was even then sufficiently large to have been exceeded but twice since the beginning of federal control, namely in 1924 and in 1921. But that is not one-half the story. The investment in the Burlington property in 1925 was $573,540,000. At the end of 1916, it was $453,315,910. There was an increase in these ten years of $120,000,000 or 26½ per cent and averaging about $12,000,000 annually. This increase in the investment in the property represented 70 per cent of the amount of capital stock outstanding on December 31, 1925, but it represented also an investment upon which the owners of the property have received not one cent in return.

It might be argued, of course, that the owners of the Burlington have by investing this $120,000,000 in their property in the past ten years so succeeded in increasing the efficiency of the plant as to have enabled it to continue to earn its 10 per cent dividends. In other words, if the money had not been so invested the company could not have become adequately efficient so as to live under present conditions on ton-mile earnings of but 0.965 cents. But no one can allege that that is fair. The public has no right to demand such a sacrifice as this. It should realize that the Burlington owners have had set up a very high ideal of their duty to the public and the shipper. What is even more important they must realize that there is a limit beyond which the investment of funds in a public utility without any return—let alone adequate return—can go.

The Burlington operates a total of 9404 miles of line. It has been owned since 1901 jointly by the Northern Pacific and Great Northern and gives these two carriers their entrance into Chicago. On the other hand the community of interest has been of great value to the Burlington. It has given the Burlington territory more adequate access to the Northwest. This applies particularly to coal which the Burlington secures in Illinois and supplies for railroad and industrial fuel in the eastern portion of the northwestern region. It is the common thing in such an analysis as this to compare the situation of the Burlington with that of the Chicago, Milwaukee & St. Paul. The two roads serve similar territory and formerly were more nearly on a parity. Acquisition of the Burlington by the Northern Pacific and Great Northern give it outlets to the west without the necessity of expansion on its own account. The St. Paul, however, had to build its own extension to the west and the beginnings of its failure date back to the time that this extension was built. Furthermore, the Burlington acquired its Illinois coal feeders as far back as 1904. The St. Paul acquired its coal feeder in the form of the Chicago, Terre Haute & Southeastern in 1921 and its directors, appearing in the Interstate Commerce Commission investigation of the St. Paul receivership, have been questioned concerning the price that was paid.

The Burlington lines occupy principally that territory stretching across Illinois, thence paralleling the boundary line between Iowa and Missouri, and extending westward across southern Nebraska with lines beyond to Denver, Colo., and to Laurel and Billings, Mont. The lines in Illinois which serve the coal areas extend south to St. Louis and to the Ohio river at Paducah. Connection with the two proprietary companies is made at Laurel and Billings and, of course, by means of the important link between Chicago and St. Paul. In addition to these lines the Burlington also owns a majority of the stock of the Colorado & Southern which in turn owns all of the stock of the Fort Worth & Denver City and the Wichita Valley lines and a half interest in the Trinity & Brazos Valley, the last of which is in receivership. The Colorado & Southern properties constitute the only line extending in a northwest-southeast direction between the southwest and Colorado. The Colorado & Southern itself is not particularly prosperous but the Fort Worth & Denver, due presumably to its reaching the oil country of the Southwest, seems to be much favored. Progress is being made on plans for extension of this part of the Burlington system into the newly opened up agricultural areas of



The Chicago, Burlington & Quincy and Controlled Lines

	Mileage Operated	Net Railway Operating Income Total 1924	Per mile Operated	Return on Investment Per cent
Chicago, Burlington & Quincy..	9,407	$28,742,112	$3,055	4.8
Colorado & Southern.....	1,092	1,779,941	1,631	1.9
Fort Worth & Denver City....	457	3,832,662	8,393	10.5
Wichita Valley	272	608,161	2,237	9.0

western Texas. The following is an interesting picture of the relative earning power of the several parts of the Burlington system.

40 Per Cent

Much of the Burlington story is told in the character of its traffic. In 1925 the revenue tonnage was divided as follows: Products of agriculture, 18.28 per cent; animals and products, 6.81 per cent; products of mines, 44.40 per cent (coal 31.10 per cent); products of forests, 5.47 per cent; manufactures and miscellaneous, 21.14 per cent and l.c.l., 3.90 per cent. It is known, of course, that products of agriculture and live stock have had the least increase in freight rates since the war. The briefs of the carriers in the western rate case have emphasized that the rates of live stock are particularly non-lucrative and away out of line with other rates or with the increased cost of doing business. The Burlington's traffic in animals and products in 1925 was, as above indicated, 6.81 per cent of the total revenue tonnage. However, it made up about 20 per cent of the total number of carloads. The products of agriculture similarly constituted about 20 per cent. This means that, of the Burlington traffic measured in carloads, 40 per cent was of that class of traffic which bears the smaller share of the burden of cost of transportation. This readily explains why it is that the Burlington has had an increase of but 36 per cent in its ton-mile earnings since 1916. It is also a matter of record that the coal fields of Illinois have suffered from the Jacksonville wage agreement and the resulting disadvantages which that has created in the competition with the non-union coal fields south of the Ohio river. The Burlington coal traffic in 1925 was 31.10 per cent of the total tonnage; it was 6½ per cent greater than in 1924 but it was 1½ per cent less than in 1923. The small decrease from 1923 might indicate that the Burlington serves a large proportion of more efficient mines.

Table II. Comparison of Selected Freight Operating Statistics

	1925	1920	Per cent of change Inc.	Dec.
Mileage operated	9,333	9,305	....	....
Gross ton-miles (thousands)	31,366,211	33,506,119	....	6.3
Net ton-miles (thousands)	14,248,158	16,380,335	....	13.0
Freight train-miles (thousands)	18,396	21,386	....	14.9
Freight locomotive-miles (thousands)	19,867	23,460	....	15.3
Freight car-miles (thousands)	838,789	853,594	....	1.6
Freight train-hours	1,446,438	1,982,994	....	27.2
Tons of coal consumed by freight locos.	2,571,915	3,348,147	....	23.2
Car-miles per day	32.5	32.1	1.4	....
Net tons per loaded car	26.9	28.8	....	6.6
Per cent loaded to total car-miles	63.1	66.6	....	3.5
Net ton-miles per car day	552	616	....	10.4
Freight cars per train	46.5	40.9	13.7	....
Gross tons per train	1,705	1,567	8.8	....
Net tons per train	775	766	1.2	....
Train speed, miles per train-hour	12.7	10.8	17.6	....
Gross ton-miles per train-hour	21,685	16,897	28.3	....
Net ton-miles per train-hour	9,851	8,260	19.3	....
Lb. coal per 1,000 gross ton-miles	146	.....	....	....
Loco-miles per loco-day	54.0	71.1	....	24.0
Per cent freight locos. unserviceable	18.4	27.4	....	9.0
Per cent freight cars unserviceable	7.5	7.1	0.4	....

In 1925 as compared with 1924 the Burlington had a decrease of 0.92 per cent in its freight revenues, a decrease of 5.30 per cent in its passenger revenues and a decrease of 2.16 per cent in its total operating revenues. The decrease in revenues was $3,519,700. Operating expenses decreased $3,286,866 or 2.74 per cent, and of this $2,788,695 was in transportation expenses which decreased 4.82 per cent. The most important single factor was the saving in fuel, the charges to that account being reduced $1,687,305 or 12.94 per cent. The revenue tons in 1925 were 1.24 per cent greater than in 1924 and the revenue ton-miles increased 0.09 per cent but there was a decrease in the revenue per ton-mile of 1.03 per cent. The revenue passengers carried were 6.66 per cent less in 1925 than in 1924 and there was a decrease of 1.72 in the revenue passenger miles.

The usual selected operating statistics are given in Table II with comparisons as between 1925 and 1920. They show only too well the results of the decreased traffic but the reader will note the larger decrease in the freight train-hours and in the fuel consumption. The cause of the former is seen to be the increase in the train speed from an average of 10.8 miles per train-hour in 1920 to 12.7 in 1925 or 17.6 per cent. The result shows in an increase in the gross ton-miles per train-hour of 28.3 per cent.

The Burlington seems to be unfortunate from the standpoint of its rate structure and perhaps also its volume of traffic. Large expenditures for capital improvement (upon which the owners have earned no net return whatever) combined with everlasting vigilance have enabled the management to conduct the property's operations with such efficiency that the disadvantages have been overcome in part. At least the Burlington has been enabled to maintain its 10 per cent dividends. It can not now be considered the prosperous property that it once was. Very plainly, it needs rate relief.

Report on Derailment at Pierron, Illinois

W. P. BORLAND, director of the Bureau of Safety, has reported to the Interstate Commerce Commission on the derailment of a fast passenger train on the Pennsylvania at Pierron, Ill., 38 miles from St. Louis, on March 13, at 5:55 a.m., in which one engineman and two firemen were killed and six mail clerks, two passengers and one express messenger were injured. Westbound passenger train No. 13, consisting of nine express and mail cars, one coach and one sleeping car, drawn by two locomotives, was derailed because of excessive speed on leaving a short section of new track, the curve being about seven degrees and the speed about 35 to 45 miles an hour. Both locomotives were overturned and the first seven cars were badly damaged. The engineman of the leading engine had not read the notice requiring speed to be reduced on the new track, which had just been put in use, and he entered upon it before he realized his position. This engineman was badly injured and could be questioned only briefly.

The train had left Terre Haute, Ind., 131 miles east of Pierron, at 2:50 a.m. Engineman Bennett of the leading engine, arrived at the station at Terre Haute only a short time before the arrival of the train from the east. After changing his clothes he was proceeding to the telegraph office for the purpose of examining the bulletin board, when the train entered the station; he then "forgot" to go to the telegraph office, went directly to the locomotive and did not exhibit his time table to the operator as was required by the rule. By this neglect he missed seeing general order No. 238 which required reduction of speed over the section of new track. In addition to this, he passed a slow-board at which, according to the evidence of numerous witnesses, a yellow light was properly displayed.

Conductor Mainard had received order No. 238, but the train was on the new piece of main track before he realized it. He was asked about the slow-board but said

it was almost impossible to see those boards at night from the cars; furthermore, he had implicit confidence in the two enginemen, with whom he had worked for years. The conductor, like the engineman, had habitually neglected the rule to exhibit his time table to the operator at Terre Haute.

Baggageman Thompson had a time table but had not seen order No. 238 and knew nothing of the speed restriction; he generally observed the bulletin board but on this occasion had not done so.

Several witnesses testified that the yellow light at the slow-board could be seen a half mile away.

Operator Sebree, at Terre Haute, said that it was not the practice for employees to show their time tables to him. General orders were received in sticker form and the trainmen themselves put these into their time tables. At first, employees had exhibited their time tables, according to the general order, but on numerous occasions he had had to keep them waiting, and they would grow impatient; and this resulted in gradual deviation from the requirement of the rule.

The fireman of an eastbound train had seen Engineman Hackett of the second engine of No. 13, at Terre Haute, who remarked that he would leave it to the engineman of the leading engine to look out for the new track at Pierron.

The report, in conclusion, puts the responsibility on Engineman Bennett, but holds Engineman Hackett at fault for not applying the brakes, he having received a copy of order No. 238. The inspector concludes that probably Engineman Bennett, when registering for duty, wrongfully concluded that order No. 238 was one that he had already received. This engineman was known to have been involved in domestic troubles but, replying to a question, he denied that this contributed to his failure. Continuing, the report says that "the rules were adequate to cover the situation had they been either enforced by the officials or obeyed by the employees. The evidence indicated, however, that for several months it had been customary to leave to the men themselves the duty of keeping properly posted as to the issuance of general orders; in other words the system existed only in name and not in fact. The failure of the system to function apparently does not affect the status of Engineman Hackett, but it presents an ample explanation as to why Engineman Bennett's forgetfulness went unchecked. * * *."

Tank Cars for the Transportation of Coal Tar

THE Standard Tank Car Company has just completed at its Sharon, Pa., plant a 20,000 gal. tank car for the transportation of coal tar. This is one of an order of nine placed with this company by the Jones & Laughlin Steel Corporation, Pittsburgh, Pa. The cars, when completed and in service, will operate between their Aliquippa, Pa., and Pittsburgh plants.

The car contains three domes in order to facilitate its loading. In addition to the regular inside valves for unloading, two outside outlets with valves attached are also provided. The tank proper is 43 ft. in length and

This Tank Car Weighs Empty 88,000 lb., Has a Maximum Capacity of 200,000 lb. and 20,000 Gals. of Coal Tar

9 ft. 1 1/16 in. in diameter. The underframe is 44 ft. 3 in. long over the end sills. The distance between the centers of the trucks is 33 ft. 10½ in.; the over-all height, 14 ft. 6 7/16 in., and the extreme width, 9 ft. 10⅜ in. The length over the striking plates is 45 ft.

The tank shell is of the seven-ring type, built throughout of 9/16-in. plate.

The cars are equipped with four-wheel Fort Pitt arch bar trucks of 100 tons capacity. Rolled steel wheels are used; the journals are 6½ in. by 12 in. The wheelbase is 5 ft. 10 in. The cars are equipped with Stucki side bearings, the National M-17 draft gear, Farlow attachments and two sets of Westinghouse air brake per car. Each car contains a set of 16 lines of heating coils built of 2-in. extra heavy pipe running the full length of the car.

The empty weight of the cars is 88,000 lb., each car having a maximum capacity of 200,000 lb.

Fuel Association Completes Successful Convention

Numerous addresses and committee reports followed closely by unusually large attendance

SOME of the outstanding addresses and several of the committee reports presented during the first two days' sessions of the eighteenth annual meeting of the International Railway Fuel Association, held at the Hotel Sherman, Chicago, May 11 to 14, were presented in abstract in last week's issue of the *Railway Age*. In this issue are given abstracts or summaries of some of the later reports and addresses, as well as the election of officers for the coming year which took place at the closing session Friday morning, May 14.

The New Officers

The officers who were elected to serve during 1926-27 are as follows: President, E. E. Chapman, engineer of tests, A. T. & S. F.; vice-presidents, J. E. Davenport, superintendent, N. Y. C.; W. J. Tapp, fuel supervisor, D. & R. G. W., and T. C. Hudson, assistant general superintendent motive power, Canadian National. Four members were elected to the Executive Committee as follows: C. H. Dyson, assistant fuel agent, B. & O.; C. I. Evans, chief fuel supervisor, M.-K.-T.; V. L. Jones, assistant mechanical engineer, N. Y. N. H. & H.; L. P. Michael, mechanical engineer, C. & N. W.

The Executive Committee has fixed the dates for the 1927 convention to begin on May 10. This convention will be held at Chicago.

Abstracts of addresses by H. R. Safford, vice-president, Missouri Pacific, and R. J. Elliott, purchasing agent, Northern Pacific, and a summary of an address by C. E. Brooks, chief of motive power, Canadian National, are presented below, together with abstracts of several committee reports.

Engineering Factors in Fuel Conservation

By H. R. Safford
Vice-president, Missouri Pacific

There are five items in particular that, in my opinion, call for concentrated attention upon an Engineering basis and which appear to have a field of great possibilities.

The first is the unit of performance that gives weight to the time element. I know this is a complex thing but it has much to do with the comparisons of use data. It has quite a definite bearing upon the economics of the design of main line from a capacity standpoint. Mere consumption per 1,000 gross ton miles without the measure of the time element will never permit a finished scientific treatment of the problem.

The economic speed of freight trains is, in my opinion, one of the least considered and one of the most important factors in fuel use. The tendency today is toward faster service. Our present competitive situation, which leaves service only as the argument for the expression of preference by the shippers, is placing speed at the top of the list of factors and if not given its true economic value may easily lead us into extravagance. On the other hand, however, the idle time of locomotives is a direct and wasteful leak. Our problem is to cut idle time rather than to increase speeds.

Train speed is a matter of great importance, not only in fuel matters but in other features of the economics of train operation. I believe here is probably the most fertile field for research, for much may be gained or lost by perfection or neglect of the value of this feature. The influence of rise and fall of speed is another important feature warranting the determination of co-efficients of comparatively easy application and of practical value. To do so will introduce much more intelligent handling of the economics of fuel use.

The long run is an engineering question of present day prominence with many evidences of success and it should be encouraged where the saving in engine hours and locomotive turning cost is greater than the burden of maintenance.

The pre-heating of locomotives from central power plants is a subject of increasing importance and prominence. There can be little doubt of the fact that the saving in both time and expense is substantial. Against this, of course, is the investment and carrying charge of the distributing plant and the influence of the varying boiler load on a central plant.

It was thought, some years ago, that the development of the locomotive would be from steam to electricity, with central power supply. That was a perfectly natural thought and interesting examples of such a theory of development have been provided. Conversion of locomotive type from coal to some other power will generally be brought about by two major influences. One will be the requirements of civic betterment. The other will be the need for power economy. The first is economic in part only. The second is entirely economic.

Up to the present time, it seems to be well established that a complete substitution of central power supply electric operation is not universally desirable or practicable, that each substitution is an individual problem and that the application of the central power supply plan is quite limited.

The regenerative possibility seems to be an essential feature in the economic justification of the central power supply plan. In a study a few years ago, on a line with a heavy density of freight traffic, approximating 120,000 gross ton miles per mile of line during the peak movement, when units of 60,000-lb. tractive force had been provided, with a rating of 6,000 tons, and where coal could be obtained at cost, it was found that conversion to electric operation, over a 160-mile district, would not yield in economic return more than half the interest. Yet, of course, where regeneration is possible an altogether satisfactory return is possible, as developed by the results on the C. M. & St. P.

For the great bulk of our railway mileage lies in territory without the regenerative possibility so it seems clear that some other method must be found to meet the economic demand, and there has come, in initial stages only, the combination oil-electric idea, with indication of considerable success. Its possibilities for answering the two

major demands begin to appear. It is able to eliminate water supply, cinder and coal handling devices, stops for fuel and water, boiler repairs, turning expenses, including boiler washing, and a substantial reduction in machinery parts. These conditions would make great reductions in operating expenses of many classes. In civic betterment, which requires elimination of smoke, the idea, if it can be successfully developed, will solve the vexatious problem of interchange where that is a very great barrier to electrification.

Fuel conservation is not all a locomotive firing proposition. It is an operating problem, a maintenance problem and while, perhaps, there is not so much engineering science in the handling of locomotive turning, to minimize delays and waste of fuel, nor much of formulae and higher mathematics in keeping down steam leaks and wasteful practice in upkeep of property, there is just as much necessity for good, loyal effort in these as in any other phase of the whole subject.

The Relation of Coal to Dividends

By R. J. Elliott

Purchasing Agent, Northern Pacific, St. Paul, Minn.

Coal being laid down in the creation of things, man cannot change it to his use except through destruction, and it is that process from the vein to the amount of coal it takes to pull a ton of freight one mile that we are particularly interested in at this time.

The day is rapidly passing, when it may be assumed that "all that is black is coal." Certain things other than coal are included in the veins. Our first job is to remove them. I do not believe users of coal should longer submit to paying for bone, slate or other foreign matter just because its home happens to be located in the coal deposit.

The next step, for the men who buy to take, is to find a kind of coal that can be best burned in the particular locomotives his company own. His neighbor's experience is interesting, but of little value, as his duty is to work out his own salvation by satisfying himself through service tests on his own railroad, the kind and size of coal that will evaporate the greatest number of pounds of water per pound of coal under his own conditions.

The coal problem of the various railroads differ widely. Many in the East are particularly fortunate in having the best bituminous coals mined along the rights-of-way, meaning you can get mine-run coal into your locomotive tenders with three handlings; that is, from mine to car, to dock, thence to the locomotives, and sometimes you do the job taking the coal direct from the mine tipples. How different it is to provide the Northern Pacific with eastern coal, where it is necessary to handle the coal 12 times from mine to locomotive, and it is therefore doubly important that we see to it that only coal that will burn is loaded at the mines, as the freight charge is greater than the original cost of the coal, and the same tariff is applied to bone and slate as to coal proper.

The Purchasing man can make little progress without the assistance of the men who go to make up this association who must be given credit for the wonderful development in the use of coal in the transportation business. No results can be gained by having the best coal available unless locomotives are constructed to burn it economically. The finer sizes and cheaper grades of coal are popular of late. It is because fuel and mechanical men have designed grates that will burn this coal and not permit the coal to go into the ash pan in its original state. Also, the stack loss has been reduced by the application of proper netting, and the locomotives are so designed as to insure proper combustion, all resulting in a one dollar coal being made to do the same work as a two dollar coal. That is what I call good business.

The relation of coal to dividends is that of a big brother. The fuel, mechanical and purchasing men can, through their combined efforts make coal the most important member of the dividend family.

Mechanical Factors in Fuel Economy

By C. E. Brooks

Chief of Motive Power, Canadian National

C. E. Brooks, chief of motive power, Canadian National, in a prepared address on this subject said that while to some of the older members the introduction of compounding might be considered as the first development to focus attention on fuel economy, to most men in railroad service today it would appear that the advent of the superheater about 16 years ago really marked the beginning of real thought in this direction. Following the superheater, Mr. Brooks called attention to the advent of the feedwater heater, the syphon and many other locomotive appliances. All of which these, he said, have tended to obscure the fundamental consideration in locomotive design for fuel economy; that is, sufficient grate area and sufficient boiler heating surface. Today, he said, there is a distinct movement to take full advantage of these factors, accompanied by a disposition to develop the use of higher boiler pressures. The latter, he said, might ultimately mean a return to compounding.

Coal and Air Brake Charging

Among the mechanical factors affecting fuel economy, Mr. Brooks stressed the importance of suitable coal, the use of air brake charging plants in yards and other means of making it possible to have no terminal delays, which increase running speed and fuel consumption. He also pointed out that intermittent yard work is the cause of much fuel consumption, which points to the need of long runs to keep the amount of yard switching to a minimum. He called attention to the fact that in yard service 14 times as much fuel may be burned as would be required in road service to do the same amount of work.

Fuel Economy Devices

Mr. Brooks expressed the opinion that the line between the first cost and cost of maintenance of fuel economy devices for application to the steam locomotive and their value as measured in fuel saving, is nearly reached. If the same energy is devoted to the development of the internal combustion locomotive toward reducing the first cost, as has been displayed in similar developments in the automobile industry, there will be an immediate and great development wherever water and fuel conditions introduce heavy operating cost factors. He pointed out that even with doubled steam locomotive efficiency, it will still be less than one-third that of the oil engine in its present state of development, with the additional advantages of less standby losses and reduced fuel transportation and handling costs. This development, he said, can not be permanently deferred by opposition from any source.

In speaking of the part of the mechanical officer in the fuel economy program, he suggested that this officer should be listened to in connection with the selection of fuel just as much as in the selection of the locomotive itself. Mr. Brooks expressed the opinion that had the mechanical officer's judgment governed in all cases in the past in the matter of the selection of locomotives, there would today be fewer under-boilered locomotives in service. The mechanical officer, he said, may be depended upon to carry on toward better conservation of fuel.

Report of Committee on Storage Coal

It is interesting to compare the fuel condition as presented by F. G. Tryon at our 1924 convention with the fuel situation during the year 1925. There follows a statement from Mr. Tryon's analysis of the report of the United States Coal Commission:

When business is fairly active our annual requirements for home consumption and export are about 528,000,000 tons per year, or 44,000,000 tons per month. The statement shows the monthly quotas in which this total is likely to be called for by the consumer as indicated by the experience of the past eight years:

	Tons actual output	Tons above average	Tons below average
January	48,000,000	4,000,000	.....
February	46,000,000	2,000,000	.....
March	42,000,000	.....	2,000,000
April	36,000,000	.....	8,000,000
May	39,000,000	.....	5,000,000
June	40,000,000	.....	4,000,000
July	42,000,000	.....	2,000,000
August	44,000,000	.....	.....
September	45,000,000	1,000,000	.....
October	48,000,000	4,000,000	.....
November	51,000,000	7,000,000	.....
December	47,000,000	3,000,000	.....
Year	528,000,000	21,000,000	21,000,000

The production of bituminous coal during the year 1925 was as follows:

	Tons actual output	Tons above average	Tons below average
January	51,930,000	8,350,000	.....
February	38,985,000	.....	4,595,000
March	37,625,000	.....	5,955,000
April	33,700,000	.....	9,880,000
May	35,475,000	.....	8,105,000
June	37,165,000	.....	6,415,000
July	39,580,000	.....	4,000,000
August	44,885,000	1,305,000	.....
September	46,815,000	3,235,000	.....
October	53,205,000	9,625,000	.....
November	50,780,000	7,200,000	.....
December	52,815,000	9,235,000	.....
	522,960,000	38,950,000	38,950,000

During the eight-year period studied by the Coal Commission, it was estimated that the amount of storage coal included in the total of 528,000,000 tons, was 40,000,000 tons, and that an additional storage of 21,000,000 tons would equalize mine production and transportation, provided the coal was stored between the months of March and August, and used during the succeeding months.

The Government reports show a storage of 48,000,000 tons, as of November 1, 1925. It is, therefore, logical to assume that in order to have equalized production and transportation during the year 1925, it would have been necessary to have stored over 80,000,000 tons, or practically 20,000,000 tons in excess of the maximum storage as determined by the Coal Commission, under conditions which existed prior to 1924.

Equalization of Bituminous Production by Storage Not Practicable

It is very evident that we have entered a period of overproductive capacity in the bituminous coal industry. The greater efficiency of our railway transportation is largely responsible for this condition, for only a few years ago the available outputs of large mining districts were held to 30 or 40 per cent of their available capacity during times of great demand for fuel, because the serving carriers were not able to furnish the necessary transportation. Under the present conditions it is not necessary to equalize transportation in order to prevent fuel shortage, because our railways have demonstrated that they can efficiently handle the maximum amounts of fuel demanded by the trade.

The storage of coal does not increase the consumption, and so long as the available output of the mines is so far in excess of the consumption, it is not practicable to equalize the monthly mine production by the storage of coal. Over-production and excellent transportation produce keen competition, with a resulting low price and better quality coal. The labor situation, insofar as it affects the aggregate output of bituminous coal, is unquestionably better at the present time than it has been for many a year. The coal operators under present conditions are hardly able materially to decrease their prices on fuel purchased for storage during the months of low demand, because they cannot look forward, as in former years, to materially higher prices during times of great demand for fuel.

With low prices for fuel, excellent transportation, and satisfactory labor conditions, there is not the general necessity for storing, nor the incentive to store coal, that existed in former years.

Because of the lesser freight charge on fuel handled to destination via rail and boat, the storage of fuel so transported, will continue. It is expected that the shipments to the great lakes docks will move more uniformly during the season of 1926 than in 1925, and if such a program is carried out, the summer and fall mine outputs will be more nearly equalized, to the extent of approximately 2,000,000 tons. Other consumers receiving all rail shipments will, of course, carry some fuel in storage, but it is logical to believe that such storage will be small, as compared with the storage of previous years.

Railway storage data, collected up to February 10, 1926, shows approximately 50 per cent less coal stored during the year 1924 than in 1923, and approximately 50 per cent less coal stored during the year 1925 than in 1924. Reports also indicate that some of the coal stored during the year 1923 still remains in storage.

Preventing Losses from Spontaneous Combustion

There are a few coals in the United States, which, because of their chemical constituents, have a very great affinity for oxygen, and will not store safely above ground. These coals, however, form only an extremely small percentage of the total coals available.

The coal selected for storage should be as firm in structure, as low in sulphur content, as low in slack content, and of as good quality, as it is practicable to obtain. The cost of freight, the storage handling charges and insurance, are, of course, no greater for a higher quality coal. The firmer the structure and the lower the slack content, the smaller the percentage of fine coal in the pile. It is universally recognized that slack and fines oxidize and produce heat at a more rapid rate than the larger sizes of coal. The fines also settle toward the bottom and center of the pile, where conditions for spontaneous heating are most favorable, and where the generated heat is dissipated at a much slower rate. Laboratory tests made at the Carnegie Institute clearly show that the "critical temperature" for the fine sizes of coal is materially less than the critical temperature for the larger sizes. The "critical temperature" is the temperature at which heat is generated so rapidly, that, provided no deterrent is applied, the coal will eventually ignite.

There is a considerable difference of opinion as to the proper height to which coal may be piled with safety. There is, of course, an advantage in storing coal reasonably high, because of the lesser area of coal exposed to the weather, and the lesser land area required. The height of the pile should be determined by the capacity or the adaptability of the facilities available for handling the pile in the event of abnormal heating. With an ordinary locomotive crane available, it is considered safe to pile Eastern coals to a height of approximately 22 ft. It is essential, however, that the coal be stored so as to avoid the segregation of the larger sizes and the fines.

The Bureau of Mines some time ago made a study of

storage coal fires, and found that 75 per cent of the fires studied occurred within 90 days after the coal was placed in storage. It is, therefore, very important that temperature determinations be regularly made, beginning soon after the storage has been completed, and extending over a period of approximately three months, the interval between readings to be governed by the temperatures found to exist. Temperature readings may be taken by using portable or fixed pyrometers manufactured for this purpose, or the presence of heat may be detected by driving an iron rod into the coal and noting the approximate temperature of the rod when withdrawn. A temperature which is considered dangerous, that is, a temperature of 150 deg. F., is about as hot as a person can comfortably handle with the bare hand. This temperature was decided upon as the danger point, after numerous experiments made by the United States Navy.

The breaking up of the coal into finer sizes, brought about by oxidation and weathering, of course, has an effect on its efficiency when used under conditions where a large percentage of slack is detrimental. A number of tests, however, indicate that the loss of heating value as determined by analysis, is very small; that is, only from one-half of one per cent to three or four per cent. A storage pile will materially weather on all areas exposed, to the depth of from 18 to 24 in. This volume of exposed coal, however, is only a small percentage of the total amount in the entire pile.

Tests show that comparatively high temperatures must be reached before there is a material loss of coal, and that a high temperature must exist before the actual kindling or fire takes place. Experience has positively proved that ample time transpires even after a temperature of above 150 deg. F. occurs, and before the actual ignition temperature is reached, to allow for the proper handling and cooling of the heated coal.

Packing the Pile

Up to February 15, 1926, data was received covering 5,500,000 tons of coal stored by railroads during the last four years. Of this amount a total of 3,300 tons, or approximately .06 per cent was lost by fire during the years 1922 and 1923, and it is estimated that a total amount of approximately $4,000 was expended in connection with the handling of heated coal. Of the foregoing losses it is admitted that 2,000 tons were lost, and $3,000 expended in moving heated coal in connection with the storage piles where no temperature determinations had been made. Eighteen hundred tons were lost from a pile of miscellaneous coals, partially ventilated with transverse wooden ducts and old boiler flues. The fire in this latter pile was not discovered until a portion of the coal was practically ablaze, and there was a delay of six days after discovery before any effective work was begun. The partial system of ventilation had the effect of promoting the fire and of causing the fire to spread over a large area.

The Philadelphia Electric Company of Philadelphia, Pa., has at the present time 214,000 tons of bituminous coal in stock. This coal was placed on a cinder foundation, leveled and thoroughly rolled. Locomotive cranes unloaded the coal from the cars and placed the coal in successive layers of a thickness from 18 to 24 in., running the full length of the pile. As each layer was built up, it was thoroughly packed by a roller drawn by a caterpillar tractor. After the pile had thus been laid to a height of from 20 to 30 ft., it is trimmed—that is, the loose coal taken from all outside edges of the base is placed on top of the pile. This company has stored a great variety of coal in the same pile. With such coal, only one fire was experienced, and that fire kindled in a restricted area very near the surface, where the loose coal had not been removed. The fire did not penetrate into the pile, and only involved the moving of approximately one carload of coal, which was drenched with water and replaced in its former location. The Philadelphia Electric Company takes periodical temperature readings with a portable pyrometer, and reports that the temperature found ordinarily runs from 70 deg. to 90 deg. F., and that only on one or two occasions have the piles reached a temperature of 120 deg. F.

This method, or a similar method insuring the compactness of the coal in the pile, thereby preventing the ready access of air, will prevent or retard spontaneous combustion to such an extent that the hazard involved will be no greater than the ordinary hazards experienced in connection with other ordinary operations.

The report was signed by Glenn Warner (P. M.), chairman, C. I. Evans (M-K-T), H. M. Johnson (N. Y. C. & St. L.), C. E. Jones (Can. Nat.), H. M. Karstad (O. S. L.), Joseph Keller (L. V.), Mark Kuehn, W. J. Overmire (Big Four), R. E. Rightmire (Consol. Coal Co.), and A. P. Wells (C. of Ga.).

Discussion

Inasmuch as there seems to be a wide difference of opinion as to the real value of the ventilation of coal storage piles it was suggested that this subject be given much more intensive study by the committee than has so far been the case, with the idea of developing authentic data which would serve as a reliable guide to those confronted with storage problems. It was further suggested that in view of the complex nature of the problem one or two research chemists be added to the personnel of the committee. In discussing the use of ventilating tubes it was brought out that on at least one railroad these test tubes are used primarily to facilitate the convenient collection of accurate temperature data rather than for ventilation. It was brought out that some fuel supervisors are advocating the use of lump coal to eliminate the supposed objection of the slack content when better operating results are really possible by the use of a good grade of mine run coal if intelligently handled.

Report on Front Ends Grates and Ash Pans

The report of the committee this year dealt with the prevention of front end air leaks, the arrangement of ash pans, fireboxes and front ends of oil-burning locomotives, and the use of grates with restricted air openings. In discussing the inspection of front ends for air leaks the report included several photographs of a locomotive, the front end of which was being tested by filling it with water through the stack, the tubes being plugged and the exhaust nozzle capped to make them watertight. The extent to which water was leaking from the front end indicated that ordinary front end inspection methods are not as effective as they are sometimes supposed to be. The report also described a number of methods for preventing air leaks around steam pipes where they pass from the inside to the outside of the smokebox.

In the section of the report dealing with oil-burning locomotives, the fact that cast steel fire pans are being employed to a considerable extent was recorded. It was also reported that the Atchison, Topeka & Santa Fe is eliminating arch tubes from its oil-burning locomotives, and by the use of a larger stack having an integral inside extension it has been possible to open up exhaust nozzles by ¼ in. in diameter.

Last year the committee reported that in two railroads a radical departure had been made with respect to the

total air opening through grates, which runs counter to the practice of securing the greatest possible air opening recommended by the committee. The A. T. & S. F., because of the waste due to fuel falling through the finger grates then in use, had changed to a table grate in which the individual air openings were greatly reduced. After the coal losses through the grate had been stopped, it was determined by means of gas analyses that more air than was required for proper combustion was being admitted, and the aggregate air opening through the table grates was reduced to as low as 16 per cent of the grate area. The committee also reported that the Northern Pacific, in trying to burn lignite coal, resorted to a similar practice, finally coming to a table grate with conical openings ½ in. in diameter at the upper grate surface, with the number of these holes such that the aggregate air opening was brought down to about 12 per cent.

This year, the report states, the committee in reply to letters, heard from 80 railroads on this subject, 55 of which have never deliberately restricted the grate opening, and 16 of which have reduced the size of the individual holes in the grates in order to reduce the loss of fine coal into the ash pan. In most instances, however, these roads have endeavored to keep the per cent of air opening as large as possible, generally from 35 to 45 per cent of the grate area.

Of the other nine replies, four only indicate clearly that material reductions in aggregate air opening have been made, reducing it to a total of from 14 to 19 per cent of the grate area. The St. Louis-San Francisco resorted to the practice in attempting to burn different grades of slack coals in locomotive service and obtain good results with table grates having 25/32-in. conical holes and an aggregate air opening of 19 per cent, with the draft slightly sharpened. The Chicago, Milwaukee & St. Paul, in order to burn lignite coal where this is available, has found that by the use of restricted grate openings a reduction of from 15 to 20 per cent fuel consumption is effected. The Oregon-Washington Railroad & Navigation Company already burning sub-bituminous coal on a table grate having about 43 per cent air opening, experimented with grates having air openings of 14 per cent, but failed to find any advantage in this grate. The Temiskaming & Northern Ontario developed grates in which the total air opening was reduced to about 16 per cent of the grate area on an engine equipped with an exhaust governor. The road reports, however, that the tests did not show any improvement in fuel consumption of this combination as compared with the fuel consumption of the locomotive before the exhaust governor was applied and the grate openings reduced.

Northern Pacific Tests

The committee's report last year dealt at some length with the practice on the Northern Pacific where the grates with restricted air openings were developed as a part of the program to burn Rosebud coal, a Montana lignite carrying 25.66 per cent moisture and a heating value of 8,743 B.t.u. Since that time results of the tests of these grates have become available. These were represented by the committee in the accompanying table. The Red Lodge coal referred to in the table is a Montana bituminous coal bearing 11 per cent moisture and a heating value of 10,000 B.t.u. The Roslyn coal, a Washington bituminous, has about 4 per cent moisture and 12,000 B.t.u. The tests were made on a locomotive with 28-in. by 32-in. cylinders; a total weight of 320,000 lb., of which 240,500 lb. is on the drivers; 30,591 sq. ft. of evaporating heating surface; 838 sq. ft. of superheating surface, and a grate area of 70.3 sq. ft. It develops a tractive force of 57,100 lb. The grate for which the results are given in the first column of the table has a total air opening of 36 per cent of the grate area; that for which the results are shown in the third column has a total air opening of 13½ per cent of the grate area.

In connection with the Rosebud coal, attention is called to its low heating value and also to the fact that a high stack loss results from its lightness and friability. The table shows that the Red Lodge coal gives the best results with the grate having the smallest air opening, whereas with the Roslyn coal the best results are obtained with the larger air opening.

TABLE SHOWING EVAPORATION OF ROSEBUD, RED LODGE AND ROSLYN COALS ON THREE DIFFERENT GRATES—NORTHERN PACIFIC

Kind of coal	Equivalent Evaporation, Pounds of Steam per pound of coal. On ¾ in. slotted grates	On ⅝ in. round hole grates	On ½ in. round hole grates
Rosebud	....	3.80	3.73
	....	3.95	3.82
	....	3.73	3.95
	....	3.93	4.00
	....	...	3.90
	....	...	3.74
Average evaporation	....	3.85	3.86
Relative evaporation	....	99.8	100.
Red Lodge	6.06	5.89	6.07
	6.14	5.69	5.78
	5.63	5.59	6.25
	5.70	5.85	6.07
	5.60	5.82	5.80
	5.71	5.92	6.07
Average evaporation	5.81	5.79	6.01
Relative evaporation	96.7	96.4	100.
Roslyn	6.51	6.61	6.01
	6.58	6.61	6.01
	6.34	6.64	6.39
	6.83	6.39	6.23
	6.69	6.77	...
	...	6.19	...
Average evaporation	6.59	6.54	6.28
Relative evaporation	104.8	104.1	100.

The committee quotes M. A. Dlay, general fuel supervisor, Northern Pacific, as follows: "I can sum up in a sentence what may be the keynote to the improvement that we experienced with all kinds of coal on the grate having restricted openings. It is simply that the results of the tearing effect and higher rate of combustion possible with larger volumes and velocity of air through larger grate openings are not obtainable through grates having smaller openings. In other words, there is less clinkering tendency through the ability to control the air flow through smaller individual openings than there is through the larger openings, and since the excess oxygen which is present in the stack gases is about the same with the restricted or unrestricted air openings, the air supply is presumably sufficient, and, being controlled, produces less clinkering and permits the fires to be maintained in a proper condition with more ease."

In concluding, the committee made the following statement: "It is obvious from this record that the Northern Pacific in setting out to burn lignite coal, had to carry a thin fire bed, that it had to reduce the size of the individual holes in order to avoid disturbing this thin fire, and apparently with the draft prevailing in these engines it had to decrease the aggregate air opening through the grate in order to avoid an excess of air. The question arises whether this excess might not have been avoided by decreasing the draft; that is, whether after reducing the size of the individual holes the aggregate air opening through the grates might not have been kept in the neighborhood of 30 or 35 per cent, and the size of the nozzle increased.

The report was signed by Edward C. Schmidt (University of Illinois), chairman, J. S. Breyer (Southern), C. H. Holdredge (S. P.), V. L. Jones (N. Y. N. H. & H.), G. H. Likert (U. P.), John P. Neff (American

Arch Company), J. L. Ryan (I.C.), C. B. Smith (B. & M.), G. A. Young (Purdue University) and F. Zeleny (C. B. & Q.).

Report on Diesel Locomotives

The committee presented the cost figures shown in the table for one of the locomotives of this type operating on the Central Railroad of New Jersey, Bronx Terminal, during the months of December, 1925, and January and February, 1926, compared with similar operation by a steam switching locomotive during the months of December, 1924, and January and February, 1925.

COMPARISON OF DIESEL-ELECTRIC AND STEAM LOCOMOTIVE OPERATING COSTS—C. R. R. OF N. J., BRONX TERMINAL

	60-ton oil-electric Dec., 1925 Jan.-Feb., 1926	Steam Dec., 1924 Jan.-Feb., 1925
Number of days	73	74
Hours locomotive service	1,066	907
Operating fuel consuming hours	991	907
Fuel oil used—gallons	3,062	.....
Diesel lubricating oil used—gallons	74	.....
Gasoline—gallons	15	.....
Engine oil—gallons	15	15
Valve oil—gallons	30	15
Star cup grease—pounds	3	.....
Kilowatt hours generated	18,560	.....
Coal used—tons	.....	129
Number of floats—in	155	127
Number of floats—out	155	125
Number of floats—total	310	252
Number of cars off float	2,563	2,102
Number of cars on float	2,565	2,046
Number of cars—total	5,128	4,148
Gross tons handled off floats	105,076	85,668
Gross tons handled on floats	61,620	52,251
Gross tons handled—total	166,696	137,919
COST OF OPERATION		
Fuel oil 5c per gallon	$153.10	.....
Diesel engine lubricating oil, 53c-54c per gallon	39.46	.....
Gasoline, 14½c per gallon	2.16	.....
Water, $1.00 per 1,000 cubic feet	.09	$83.59
Engine oil, .262 per gallon	3.93	3.93
Valve oil, .53 per gallon	15.90	7.95
Star cup grease, .07 per pound	.21	.....
Coal, $7.15 per ton	.....	922.35
Coal handling	.....	75.00
Total cost of fuel, etc	$214.85	$1,092.82
DAILY AVERAGE		
Hours of locomotive service	14.5	12.3
Operating fuel consuming hours	13.5	12.3
Fuel oil used—gallons	39.7	.....
Diesel lubricating oil used—gallons	1.01	.....
Gasoline	Negligible	.....
Coal used—tons	....	1.7
Kilowatt hours generated	253.6	.....
Number of floats handled	4.23	3.76
Number of cars handled	70.3	56.3
Number of tons handled	2,307.6	1,908
Cost of fuel, etc	$3.02	$14.76
OPERATING HOURLY AVERAGE COST		
Fuel oil, coal, etc	$0.216	$1.20
Per car on and off floats	.042	.266
Per ton on and off floats	.0011	.0079
Cost per kilowatt hour	0.116	.....
Cost per hour locomotive service	.202	1.205

Partial operating costs of another of the 60-ton oil-electric locomotives operating on the Lehigh Valley, for the period January 8 to February 7, 1926, inclusive, are also shown in a table.

FUEL AND LUBRICATION OPERATING COSTS OF A 60-TON DIESEL-ELECTRIC LOCOMOTIVE ON THE LEHIGH VALLEY

	Jan. 8 to Feb. 7, inclusive
Hours of locomotive service	222.76
Hours of oil engine service	204.63
Kilowatt hours generated	3,532
Fuel oil—gallons	834
Lubricating oil—gallons	16
Gasoline—gallons	.....
Average oil engine load factor	8.65%
COST OF OPERATION	
Fuel oil at $0.05 per gallon	$41.70
Lubricating oil at $0.50 per gallon	8.00
Total power costs	49.70
Cost per hour of locomotive service	0.223
Cost per kilowatt hour generated	0.014

Referring to the two above statements your attention is called to the fact that the statement covering the operation on the Lehigh Valley covers only fuel oil and lubricating oil costs, and the statement covering operation on the New Jersey Central covers in addition to fuel oil and lubricating oil, costs of gasoline, water, engine and valve oils, and cup grease.

Another statement covering the operation of one of these 60-ton Oil Electric Locomotives operating at the Twenty-sixth street station, New York, on the Baltimore & Ohio, carries information covering wages of crews, maintenance and engine house expense.

This statement covers the performance during the months of January, February and March, 1926.

OPERATING COSTS OF B. & O. 60-TON DIESEL-ELECTRIC LOCOMOTIVE

Switching Service	Jan.-Mar., 1926 total	Cost per loco mile
Mileage	7,182	...
Engine hours	1,200	...
Gals. fuel oil	2,902	...
Gals. lubr. oil	163	...
Cost fuel oil	$261.71	.036
Cost. lubr. oil	$84.21	.012
Wages engine crews	$1,124.65	.157
Wages train crews	$2,078.75	.289
Maintenance	$423.24	.059
Supplies	$19.44	.003
Enginehouse expense	$413.13	.057
Total cost	$4,405.13	.613

Still another statement covers the performance of the Long Island 100-ton 600-hp. locomotive from December 22, 1925, to April 11, 1926, inclusive, showing costs of fuel and lubricating oils only.

FUEL AND LUBRICATING COSTS OF LONG ISLAND 100-TON DIESEL-ELECTRIC LOCOMOTIVE, DECEMBER 22, 1925, TO APRIL 11, 1926

Hours of locomotive service	962.75
Fuel consuming hours	853.22
Kilowatt-hours generated	52,051
Fuel oil—gallons	6,943
Lubricating oil—gallons	71
Gasoline—gallons	neg.
Average oil engine, load factor	15.3%
COST OF OPERATION	
Fuel oil at $0.05 per gal	$347.15
Lubricating oil at $0.50 per gal	35.50
Total power costs	382.65
Cost per hour locomotive service	0.398
Cost per kilowatt-hour generated	0.0073

(The report continues with brief descriptions of other locomotives now on order or previously described in this publication, and gives a brief resumé of the locomotives under construction in Europe.—Editor.)

The following are the weights of Diesel locomotives per brake horsepower for the eight types referred to in the report:

Name of builder	Brake h.p.	Weight of loco., lb.	Weight per h.p. output
Ingersoll-Rand	300	124,000	413 Lb.
Swedish Company	300	114,000	380 Lb.
Brown-Boveri	900 Rating	242,000	269 Lb. Rating
Brown-Boveri	1,200 Max.	266,000	295 Lb. Rating
Sulzer Bros.	1,000 Rating	190,000	190 Lb. Rating
Sulzer Bros.	1,600 Max.	.....	119 Lb. Max.
Baldwin	1,000	275,000	275 Lb.
Fiat Company	440	98,000	222 Lb.
Ingersoll-Rand	300	120,000	400 Lb.
Ingersoll-Rand	600	200,000	333 Lb.

These figures compare with a horsepower output in the latest steam locomotive for approximately each 100 lb. of weight.

The report is signed by J. E. Davenport (N. Y. C.), Chairman; E. J. Brennan (C. G. W.), E. J. Coleman (Ingersoll-Rand Co.), R. M. Dilworth, A. H. Ehle (Baldwin Locomotive Works), Henry Gardner (B. & O), A. Lipetz (American Locomotive Co.), Charles E. Lucke, J. K. McNellie, R. J. Needham (Can. Nat.), J. M. Nicholson (A. T. & S. F.), C. A. Norman, Frank E. Russell (Sou. Pac.), C. B. Smith (B. & M.), C. E. Uddenberg (State Railways of Sweden) and W. H. Winterrowd (Lima Locomotive Works, Inc.).

Other Reports and Discussions

In addition to the reports which have appeared in this and last week's issues, committee reports were presented on the following subjects: Fuel Stations, L. J. Joffray (I. C.), chairman; Stationary Power Plants, R. S. Two-

good (S. P.), chairman; Firing Practice, D. C. Buell, chairman, and New Locomotive Economy Devices, E. E. Chapman (A. T. & S. F.), chairman.

The report of the latter committee, in its discussion of feedwater heaters, showed that in 1925 there was a total of 2,551 heaters of the pump type and 37 of the exhaust steam injector type installed and on order in America. This report dealt largely with changed boiler conditions, describing particularly what has been done up to the present time in increasing boiler pressure and setting forth some of the difficulties which must be overcome if pressures greater than 300 to 400 lb. are to be used, such as the probable necessity for a change in the form of the boiler and the development of special cocks, valves and fittings. This report also included a discussion of mechanical cut-off control, and in connection with it was read a paper by R. W. Retterer, mechanical engineer, C. C. C. & St. L., on back pressure as an index to fuel economy.

An abstract of an address by J. J. Ekin, comptroller, B. & O., on Accounting Factors in Fuel Conservation, will appear in a later issue.

At various times during the sessions there were also held three open forums on various phases of fuel conervation.

Western Rate Case Argued Before I. C. C.

WASHINGTON, D. C.

THE duty of the Interstate Commerce Commission to allow the western railroads a rate level adequate to produce the fair return contemplated by the transportation act and generally by the Constitution was urged upon the commission by counsel for the railroads on May 19 at the opening of a ten-day argument on the application of the western roads for a 5 per cent advance in freight rates and the western part of the commission's general rate structure investigation. The commission had also combined with these cases for purpose of argument the application of livestock shippers for a general reduction of livestock rates in the West, to which the roads had countered with a request for a 20 per cent increase. Ten state commissioners sat with the commission, because of the widespread interest in the case and because the roads have applied for similar increases in intrastate rates, and the state commissioners of Texas and Oklahoma are to sit with it during the argument on the livestock rates.

The commission announced that in an effort to accord the various parties their right to open and close, the following course will be followed, subject to a few minor exceptions: "The carriers and those interested in the relief they seek will open in Ex Parte 87 and No. 17,000; thereafter counsel representing live stock interests will reply to the carriers' presentation in Ex Parte 87 and No. 17,000, and open in the live stock complaint cases; the carriers will then reply to the arguments made as to the live stock complaints, and the live stock complainants may close the arguments in the live stock complaints; thereafter in No. 17,000 and Ex Parte 87 we shall hear the representatives of the state commissions and of the shippers, and the carriers' reply thereto."

R. N. Van Doren, vice-president of the Chicago & Northwestern, opened for the railroads, referring to the application filed in April, 1925, in which the roads said they needed an increase in revenues equivalent to an 11 per cent advance in freight rates, and to their curtailment of their application to a 5 per cent advance as "emergency relief," in the hope that it might lead to more speedy consideration and more prompt relief. In this respect they have been disappointed, he said, but they believe the comprehensive record taken fully demonstrates their need of the full amount.

The application, Mr. Van Doren said, is primarily based on section 15a but in a more fundamental sense it is based on the right of the carriers, independent of the transportation act, to a fair return, although they are glad to be able to point to the specific provisions of that section as supporting their right. Commissioner Aitchison asked at this point if the application is to be construed as a demand for a specific enforcement by the commission of the provisions of 15a. "Our application would be the same in either case," replied Mr. Van Doren, "although the logic of our presentation might be somewhat different. We could claim a fair return independently of that section but we find there the recognition of our fundamental right under the Constitution with the addition of a specific percentage and a declaration of Congressional policy calling on the commission to bring about the results there specified.

The carriers are relying, Mr. Van Doren said, on their property investment accounts as a proper minimum basis on which to compute a fair return and on this basis it is a conceded fact that since the passage of the transportation act the western carriers have in no year received even an approximation of a fair return. He exhibited a large chart showing the shortage of net return in each year, ranging from $257,000,000 in 1921 to $161,000,000 in 1925, and aggregating $984,000,000 for the five years. In 1925 the percentage increased to 4.12, he said, but of the increase of about $32,000,000 in net over 1924 over one-half was required to cover an increase of $287,000,000 in investment as compared with 1924. In reply to Commissioner Meyer he said that there is controversy in the case as to the proper rate base but no contention that on any rate base they have earned a fair return. He also pointed to the reversal of the situation of the western roads in recent years as compared with the eastern and southern lines, which have had a larger percentage of return since 1921 than the western lines. If the property investment accounts be accepted as a rate base, he continued, then there is no question that the roads are entitled to increased revenue and the only question is as to how it can be obtained. There had been suggestions in the record that it be obtained in almost every conceivable way except by an increase in freight rates but the carriers say that it can only be obtained in that way and that a rate structure that has produced such results for a period of years is not a proper rate structure.

Commissioner Campbell asked about the feasibility of the Potter plan. Mr. Van Doren said that it was in the case only as part of a cross-examination and that it is not only impracticable but illegal and has been opposed by all the roads except the St. Paul.

Kenneth F. Burgess, general solicitor of the Chicago, Burlington & Quincy, took up the question of a rate base, saying that if the commission's tentative valuation for the western roads used in the 1920 rate case be brought up to date by adding new investment it would amount to $9,213,608,000, as compared with the property investment of $9,900,000,000 in 1925, and that even on that basis the western roads would have been short of a fair return in 1925 by $109,000,000, whereas for the five years the shortage would have been $721,883,798. The difference between the tentative valuation as adjusted and the property accounts, he said, would be more than made up if the tentative valuation were readjusted for increased prices.

Mr. Burgess also said that the western roads had had

their rates reduced from 1921 to 1924, largely for the relief of agriculture, by an aggregate of $844,000,000, whereas their shortage for the four years as compared with a 5¾ per cent return, was only $822,000,000.

Mr. Burgess said that whereas the general advance proposed is 5 per cent there are certain modifications for the purpose of protecting differential adjustments which are not precisely but approximately 5 per cent. In the livestock case, however, which is a separate proceeding, the roads are asking an advance of 20 per cent to avoid discrimination against other classes of traffic, because, he said, whereas the livestock rates may have been once adjusted to the other rates, they are no longer so because the traffic does not permit of the economies in the way of heavier car loading, etc., that have been applied to other kinds of traffic.

The carriers regard the other rates, with the exception of the class rates in Western Trunk Line territory which they expect to take up later, as being reasonably well adjusted with relation to each other, as the result of 38 years of regulation by the federal and state commissions.

Chairman Eastman asked if the traffic officers of the western roads had not picked out a list of commodities which they agreed should be advanced because too low in relation to others but later abandoned this plan in favor of a general advance. Mr. Burgess replied that various plans were considered but that the plan now proposed was the only definite plan advanced.

"Are you prepared to say that there are not certain commodities on which the rates are regarded as sub-normal, such as packing-house products, fresh meats, ore, copper bullion, or newsprint?" asked Mr. Eastman.

"So far as this record is concerned," replied Mr. Burgess. "Do you mean to say that with the exceptions you have mentioned a 5 per cent increase will produce a reasonable adjustment and that we will hear no more from you about sub-normal rates?" asked Mr. Eastman.

"So far as we have now proceeded," answered Mr. Burgess, "but naturally special cases will be further studied from time to time and our application is without prejudice to what may be found necessary upon further study or changed conditions."

"But these traffic managers have been on the job for a good many years," chairman Eastman continued, "and they have so far found no sub-normal spots?" Mr. Burgess said that the roads are not prepared to ask anything further at this time.

The first part of the Hoch-Smith resolution, he said, directs the commission to conduct a general investigation of the rate structure and to correct defects it may find in the light of certain standards and tests, while the second part directs the commission to give agricultural products the lowest possible lawful rates compatible with the maintenance of an adequate transportation system. As to the first part, he said, the tests mentioned are those that have been applied by the raliroads and by regulating commissions for years and it is the position of the railroads that the general rate level meets the conditions of the resolution. As to the second part of the resolution, there should be an inquiry as to whether the depression in agriculture which Congress declared to exist still exists and if so how it affects the different products. "We have presented evidence to show that agriculture now enjoys the lowest possible lawful rates that are compatible with maintaining an adequate transportation system and that the agricultural depression has passed."

Commissioner Taylor remarked that a 5 per cent increase in rates applied to agricultural products, which produce 30 per cent of the revenues, would be equivalent to a 1½ per cent increase in all revenues and asked if the carriers would be satisfied if a plan could be prepared for distributing the 1½ per cent over other commodities, exempting agricultural products. Mr. Burgess said the roads had proposed what they thought was a logical plan and that they felt it their duty to point out that it would be discriminatory to exempt agricultural products in the circumstances, but that what they primarily need is a 5 per cent increase in freight revenues and that if the commission finds that the rates as between different commodities are improperly adjusted it is incumbent upon it to require a readjustment.

Charles E. Hughes, appearing on behalf of the receivers of the Chicago, Milwaukee & St. Paul, emphasized what he called the "cardinal principles" of the case, and the duty of the commission under the transportation act to see that the railroads have adequate revenues. "The Supreme Court has held," he said "that it is the duty of the commission to provide a general body of rates that will support an adequate transportation system and that such a body of rates is reasonable for the shippers. We are not faced with a question of the relative reasonableness of rates but the question is whether the general rate level is reasonable, under honest, efficient and economical management. And that does not mean management by archangels but by men. It means a reasonable, fair standard of operation and the railroads have proved beyond a peradventure that there is not the slightest foundation for criticism of their management by that standard.

"As to the rate base, ingenuity has been exhausted in this case, but, however you arrive at a rate base and under every method that has been suggested there is an inadequacy of rates. The increase proposed is so modest that no interest will be injured unless you assume that all the others are to be assisted at the expense of the circulatory system of the country. It is the transportation system of the country. It is the transportation system of the country that has been placed by the law under the fostering care of this commission and the commission is faced with the question in this case of performing its duty under the transportation act. I am perfectly aware that there is no question of a guaranty and you are not to deal with an abnormal or temporary condition but if the rate level is not high enough tax as a body of rates, it becomes a question of doing that which Congress has declared shall be done."

Mr. Hughes said he had not expected to discuss the Potter pooling plan at any length because the railroads had opposed it and in his opinion the commission has no power to enforce it upon them but that, since the question had been raised, and in view of the criticisms of it as "illegal, unconstitutional and impracticable" he thought it his duty to the receivers of the St. Paul to say something about. "It was conceived by Mr. Potter," he said, "in an earnest endeavor to contrive an arrangement, perfectly fair, for making the rate increase as low as possible and distributing the revenue where it was most needed. The carriers generally refused to accept it and I could not see how it could be enforced. However, I should listen very attentively to an argument against its constitutionality, since the decisions of the Supreme Court in the recapture and divisions cases, and the epithet of 'socialistic' applies in even greater degree to the recapture clause. I agree that it is not authorized by an act of Congress unless the carriers consent but I know of nothing in the record that would warrant a conclusion that it is impracticable." When Mr. Eastman asked if it would be wrong for the commisssion to "strongly recommend" the plan to the carriers, Mr. Hughes replied: "I think it is the duty of the commission to raise this rate level and that the carriers were right in asking for it or more too, but if the commission can suggest some other form of relief it may do so."

Proposed Railroad Legislation

Many needed additions to I. C. law—Metric system proposal probably dead

WASHINGTON, D. C.

REPRESENTATIVE Newton of Minnesota has introduced in the House as H.R.12,065 a sort of omnibus bill containing proposed amendments to the interstate commerce act. It combines a number of amendments which were embodied in bills which he had previously introduced separately, modified as the result of extensive hearings before the committee on interstate and foreign commerce at which representatives of the Interstate Commerce Commission and the railways testified. Some of the suggested amendments originated with the commission and some with the National Industrial Traffic League. As to those which did not originate with the commission it has in the main either approved or expressed no objection. The bill was favorably reported by the committee on May 14 with an explanation of the changes proposed and the reasons for them.

One of the principal amendments would extend the period for which the commission may suspend a proposed increase in rates to seven months. An abstract of the committee's report outlining the proposed amendments follows:

Section 1: The first-mentioned amendment embodies one of the changes to the act suggested originally in H. R. 6359. The provisions of existing law provide that no carrier shall deliver freight until all charges have been paid, except under such rules as the Interstate Commerce Commission shall prescribe to "assure the prompt payment" of those charges. Under these regulations "assuring prompt payment," payment must be made within about 48 or 72 hours. Many receivers of freight felt that this time is too short, for this reason: It gives practically no time in which to study the freight bills and to compare the rate charged with the rate in the carrier's established tariff so as to see whether or not any errors have been committed. As a result, there has been a demand on the part of a great many consignees for an opportunity to make weekly settlement of their freight charges. Of course, this should only be done under suitable rules and regulations. One of these would, of course, be the requiring on the part of the consignee the furnishing of a suitable surety bond to amply protect the carrier against any possible loss of revenue during this period of settlement. By making these weekly settlements, shippers would, before payment of the charges, have time to make some investigation of the existing tariff with the idea of correcting any mistake prior to making settlement. If this were possible, it would obviate considerable expense to both carriers and shippers, growing out of the making of overcharges and undercharges.

As amended, the words "assure prompt payment" would give way to the words "govern the settlement." This would permit of a sufficient additional freedom of action on the part of the commission in providing the rules and regulations to accomplish this. The second amendment in this section embodies in a slightly amended form the suggested amendment contained in H. R. 6400. It is designed to meet a criticism of the existing law, which works an injustice on consignees who are commission men, warehouse men, or other agents. If the carrier, in rendering his charge, makes a mistake and charges less than the legal rate and later discovers it, it can still hold the consignee for the additional charge. In some instances, the mistake is discovered in a few days, while in others it may be months and even several years thereafter. Until the running of the statute of limitations, the consignee remains liable for the payment of any difference between the amount that he did pay and the amount that he should have paid had he been originally charged the rate set forth in the established tariff.

The amendment provides that a consignee, who is an agent and has no beneficial title to the property and so acquaints the carrier with the fact in writing at the time of the initial settlement shall not be liable for such additional charges. To avoid any possibility of this being used for rebating or discrimination by the carrier as between shippers, the amendment makes the consignor liable in those instances for the additional charges.

Section 2: This section amends paragraph 7 of section 15 of the interstate commerce act, as amended.

The amendment embodies, in slightly amended form, the change in the suspension period suggested in one of the amendments originally proposed in H. R. 6359. The purpose is to extend the right which the Interstate Commerce Commission now has under existing law to suspend a new rate or schedule of rates fixed by the carrier for an additional 60 days. The present law requires the commission to decide as to the justness and reasonableness of tariff rates which have been suspended by order of the commission within 120 days after the order of suspension is made. In a large proportion of the cases, the commission is unable to make the necessary investigation and determination within this 120-day period. Under existing law, this period of suspension may be extended for a further period not exceeding 30 days. In substance, this makes a total suspension period of five months. Even under this provision, the Interstate Commerce Commission informed the committee that it was unable to make the necessary investigation and determination within even the extended period. The commission suggested changing the period so as to provide but one period of suspension and that not to exceed seven months' time, which, in practical effect, would mean 60 more days than under the maximum extension period provided under existing law. Under the section as amended the commission may suspend the operation of the schedule for a period of less than seven months and by later order can extend the period for the remainder of the seven months.

Section 3: This section amends in several particulars the so-called Carmack amendment, which is a part of section 20 of the interstate commerce act. It embodies, in slightly amended form, the suggested amendments contained in H. R. 6554, by Mr. Newton of Minnesota, and H. R. 3922, by Mr. Moore of Virginia.

The Carmack amendment made the initial carrier liable for loss and damage on shipments in interstate commerce. The effect of this amendment will be to also make the delivering or terminal carrier equally responsible.

The Carmack amendment in no wise affected the liability of the connecting or delivering carrier for loss or damage occurring on its own line. The remedy provided by the Carmack amendment was in addition to the remedies then available to the shipper or owner of goods. However, generally speaking, information as to the carrier causing the loss or damage is available only to the carrier. As a practical proposition, the owner must sue the initial carrier. As a practical proposition, the owner must sue the initial carrier. In most cases, the consignee is the owner. In suing the initial carrier, he must bring suit where that carrier is operating a line of railroad or otherwise doing business so as to permit service of process. In most cases, this is outside the state of the party plaintiff or consignee. This means additional expense in the commencing and prosecution of the suit, especially as to witnesses. Oftentimes some carriers take advantage of this fact and either refuse or delay settlement of the claim. The committee, therefore, felt that the shipper should also have the right to proceed against the delivering carrier to the same extent that he now has to proceed against the initial carrier.

In view of this change, the committee thought it but fair to include a provision providing that the commencement of actions as against the delivering carrier should be brought in a state where that carrier was operating a line of railway, so that the carrier could not be forced to stand suit at some point far away from where its witnesses would be available.

Section 4: This section amends section 204 of the transportation act, 1920. It carries out a recommendation of the Interstate Commerce Commission, as embodied in H. R. 9728. Section 204 of the transportation act pertains to the reimbursements of deficits to carriers arising during the period of federal control. This amendment provides that no carrier shall be entitled to the benefits of section 204 unless a statement of claim is filed within 60 days after the taking effect of this subdivision. It is not intended by this amendment to reopen claims already decided or to require a claim to be framed with the precision of an indictment, but merely that the claim must be filed within a reasonable period and that it contain sufficient information for the commission to ascertain the nature of the claim and the facts on which it is based.

"Section 5: This section amends section 206 of the transportation act, 1920, as amended. This amendment follows, in an amended form, the amendments suggested in H. R. 6397. The purpose is to fix a statute of limitation to run against the United States Railroad Administration in the bringing of suits and claims

against shippers arising during the period of the operation of the railroads of the country by the government. The law with respect to the railroad companies has for many years required that suits by them for undercharges shall be commenced within three years after the charges accrued. The Railroad Administration was an agency of the United States government. As such, the Supreme Court held that it was the agent of the sovereign and that statutes of limitation did not run against the sovereign, unless they were so drawn as to make it perfectly clear that they were so intended to run. The committee felt that as there are claims owing the Railroad Administration, that action thereon should be brought in the immediate future, not only in justice to the shipper but in order to expedite the liquidation of the affairs of the Railroad Administration. The solicitor general of the Railroad Administration appeared, acquiesced in this view and recommended a period of 90 days after the taking effect of this subdivision, whereupon the statute of limitation would then commence to run and bar these claims.

Section 6: This section amends section 22 of the act relating to bills of lading in interstate and foreign commerce. It embodies one of the amendments suggested in H. R. 6363. The purpose of the amendment is to make the date of a shipper's order bill of lading a material part of the description of the goods so that any holder of the bill of lading, who has relied upon the date and parted with value in the belief that the shipment was made on the date shown, can hold the carrier for any damages sustained through the misdating of the bill.

Hearings on the bill to provide for the refunding of railroad indebtedness to the United States government at a reduced interest rate, before the House committee on interstate and foreign commerce, were closed on May 12 after testimony by Chairman Eastman of the Interstate Commerce Commission, which has favored the bill with some amendments added by the Senate committee, and by Ben B. Cain, vice-president and general counsel of the American Short Line Railroad Association.

Although some time ago it was being predicted at Washington that the Britten bill to provide for the introduction of the metric system of weights and measures would be passed at this session of Congress, it is now being said that the testimony given by representatives of the railways at the hearing before the committee on coinage, weights and measures was so convincing as to the confusion and additional expense that would result that the bill is "dead" for the time being. Representative Britten has now introduced a joint resolution, H. J. Res. 254, to authorize the Department of Commerce "to establish commodity quantity units for general use in merchandising after 1935, standardizing the yard to the meter, the quart to the liter, the pound to five hundred grams decimally divided."

Senator Willis of Ohio has introduced a bill, S. 4246, to make unlawful any railroad tariff provision exempting or purporting to exempt a carrier from full liability in connection with shipments of bulk grain. There is a proviso, however, that such tariffs may provide for a tolerance allowance not exceeding one-tenth of one per cent of the weight tendered the carrier, but not exceeding the amount of loss, damage or injury "which the carrier proves resulted from the inherent nature of the goods to which the carrier in no way contributed," in the settlement of claims.

Representative Denison of Illinois has introduced as H. R. 12,069 a bill to require railroads to settle all claims for loss, damage or injury to property, amounting to $200 or less, within six months from the filing of a written claim, under penalty of being liable to additional damages of 50 per cent, with a minimum of $25.

THE VIRGINIA SPECIAL COURT OF APPEALS holds that demurrage charges from the end of the free time until coal was ordered out by the tidewater shipper were not affected by a substitution of cars among members of the coal exchange, the situation between shipper and railroad remaining the same, the latter continuing to have its cars detained, although not the identical cars, until the shipper ordered his coal unloaded.—James v. N. & W. (Va.) 129 S. E. 321.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading for the week ended May 8 amounted to 996,527 cars, an increase of 13,493 cars as compared with the corresponding week of last year and of 88,324 cars as compared with 1924. Increases as compared with last year were reported from all districts except the Allegheny and the North western and in all commodity classifications except forest products and ore. Miscellaneous loading shows an increase of 25,975 cars. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

REVENUE FREIGHT CAR LOADING
Week Ended Saturday, May 8, 1926

Districts	1926	1925	1924
Eastern	243,413	235,053	222,127
Allegheny	201,901	202,140	192,524
Pocahontas	53,356	47,975	37,766
Southern	148,080	144,110	129,343
Northwestern	142,961	151,683	133,615
Central Western	133,531	129,305	133,115
Southwestern	73,285	72,768	59,713
Total Western Districts	349,777	353,756	326,443
Total All Roads	996,527	983,034	908,203
COMMODITIES			
Grain and Grain Products	36,369	35,995	41,499
Live Stock	28,963	27,669	32,040
Coal	162,453	155,667	136,181
Coke	11,922	9,382	9,009
Forest Products	74,116	76,403	73,746
Ore	38,622	64,651	45,239
Mdse., l. c. l.	265,867	261,027	249,108
Miscellaneous	378,215	352,240	321,381
May 8	996,527	983,034	908,203
May 1	995,641	984,073	913,550
April 24	973,304	961,186	878,387
April 17	964,935	923,844	876,916
April 10	929,506	918,400	880,937
Cumulative Total, 19 weeks	17,773,603	17,476,346	16,907,994

The freight car surplus for the period April 23 to 30 averaged 276,573 cars, a decrease of 9,630 cars in a week. This included 115,205 coal cars and 118,419 box cars. The Canadian roads for the same period had a surplus of 21,184 cars, including 18,100 box cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended May 8 were 1,501 cars heavier than for the previous week. Navigation on the upper lakes opened on May 1 and this had effect on grain loadings in the western division where there was an increase of 866 cars. Coal increased in both divisions. Compared with the same week last year the increase was 6,847 cars.

	Totals for Canada			Cumulative totals to date	
Commodities	May 8, 1926	May 1, 1926	May 9, 1925	1926	1925
Grain and grain products	6,399	5,499	5,448	118,997	113,841
Live stock	1,992	1,952	2,039	37,012	40,303
Coal	4,373	3,713	2,021	78,938	73,528
Coke	301	385	242	8,056	5,462
Lumber	3,493	3,734	3,578	60,004	56,932
Pulpwood	1,918	1,984	1,545	62,499	62,180
Pulp and paper	2,489	2,478	2,170	46,558	38,597
Other forest products	3,135	3,177	2,737	63,320	55,772
Ore	1,468	1,506	1,354	25,585	21,468
Merchandise, L. C. L.	17,078	17,362	16,654	278,636	266,147
Miscellaneous	14,622	14,077	12,733	212,976	192,816
Total cars loaded	57,368	55,867	50,521	992,581	926,986
Total cars received from connections	37,695	37,812	32,700	673,977	606,411

THE PENNSYLVANIA SUPREME COURT holds that it is unnecessary, in proceedings to locate a railroad, to specify the number of tracks it is proposed to construct, so as to bring the deep cuts and fills within the 60 ft. provided for by Pa. St. 1920, section 18434, the company being entitled to that width in addition to land for cuts and fills. It is also held that the Legislature has power to permit a railroad company to occupy the bed of its highway, and the railroad might take by eminent domain the land necessary to relocate and reconstruct the highway, as required by the statute.—Foley v. Beech Creek Extension (Pa.) 129 Atl. 845.

Western Railway Club Holds Annual Dinner

Over 800 members and guests hear addresses by R. H. Aishton and Robert C. Ross

THE Western Railway Club held its annual meeting and dinner at the Hotel Sherman, Chicago, on May 21, with more than 800 members and guests in attendance. Following the dinner, President W. F. Thiehoff, general manager of the Chicago, Burlington & Quincy, made a brief address in which he reviewed the progress of the club during the past year and made some suggestions regarding ways in which its influence and value may be expanded during the coming year. Mr. Thiehoff then introduced the speakers of the evening, R. H. Aishton, president of the American Railway Association, who discussed the subject of "Efficient Railroad Operation," and Robert C. Ross, traffic manager of Joseph T. Ryerson & Son, Inc., Chicago, and general chairman of the Mid-West Shippers' Advisory Board, who dwelt on some of the problems and accomplishments of the shippers' advisory board with which he is connected.

After the addresses, the report of the Nominating Committee was read and the following officers elected for 1926-1927: President, F. W. Rosser, superintendent transportation, Chicago region, Erie, Chicago; first vice-president, W. G. Black, superintendent motive power, New York, Chicago & St. Louis, Cleveland, Ohio; and second vice-president, C. G. Juneau, master car builder, Chicago, Milwaukee & St. Paul, Milwaukee, Wis.; members of the board of directors: W. F. Thiehoff, general manager, Chicago, Burlington & Quincy, Chicago; K. F. Burgess, general solicitor, Chicago, Burlington & Quincy, Chicago; and A. W. Towsley, general superintendent, Chicago, Rock Island & Pacific, Chicago. Bruce V. Crandall was re-elected treasurer of the club and the board of directors will elect the secretary.

Efficient Railroad Operation

By R. H. Aishton

President, American Railway Association

Just recently I met a train at one of the large terminals in this city. According to schedule, it was due to arrive at thirty minutes past nine. I was down at the station well ahead of time, where a large indicator informed me, as well as others, that this particular train would arrive on Track No. 5 "On Time." The indicator showed that the train was coming from San Francisco, Sacramento, Salt Lake City, Denver and Omaha.

At twenty-eight minutes past nine, the spidery finger of the telautograph began to make hieroglyphics on the sheet of paper. In another minute a line of "red caps" formed and the gates opened, just as the great engine was seen rounding the curve at the far end of the station platform, with its burden of 1,025 tons of steel cars carrying their human freight. It came to rest at nine-thirty on the dot, with the triumphant air of a conqueror.

I couldn't help thinking what a symbol of American efficiency that was. For three days and three nights that train had served hundreds of people, not only with transportation, but with their meals and lodging; had attended to their comfort and pleasure as it traversed the length and breadth of eight sovereign states; had crossed arms of the sea, broad rivers and mountain ranges; had plunged through the darkness of tunnels; had hurried through scores of cities, towns and villages. Its presence had been signaled from and to I know not how many lonely cabins, towers and offices, and here it was, on the tick, riding in its stately way up to the bumpers, its long journey over.

One other thing I noticed, however, even more striking, when one stops to think of it, than the manner of its arrival. This was the fact that everybody took this achievement for granted and nobody seemed to think it remarkable. Passengers got out of their cars, seized their baggage, greeted their friends, hailed their taxis, with never a glance at the locomotive, cars or the personnel who had been at their service; and it remained for me, who had some knowledge of what had rendered this performance possible, to take off my hat, metaphorically speaking, to the men, from the executive, who planned the system, to the multitudes of workers, who had to operate this wonderful machine of railway traffic.

Think first of the foresight and planning that had to go to the arrangement of that run, so that the train might have a clear course over approximately 2,261 miles of line, with its numerous intersections and junctions. Think of the mechanical ingenuity that had to be applied to insure its safety and smoothness. How many eyes had to watch lest there be the slightest deviation to threaten catastrophe! How many gates had to be opened, levers pulled, messages telegraphed ahead, branch line trains and freight trains got into the clear in time to afford this train clear passage.

And then consider that this is only one of many trains on this individual system every day and that through the length and breadth of this country this same thing is going on, back and forth like the shuttle of a loom every day, all day and all night, work-days as well as holidays, Sundays as well as week days; and then think that all this is the result of a type of organization, reaching down to every axle and bearing, such as would make any of the great battles of history appear like the efforts of amateurs in comparison.

What takes place every day in any large terminal is a feat of organization, of the direction of means to ends, that would knock the strategy of Napoleon and Wellington cold.

The executive of a railway is, in many respects, like the officer in command of any army corps. The running of trains is a phase of military tactics, in which system, devolution of functions, inspection and control is pitted against human fallibility, mechanical inertia, time, distance and weather. In the constant battle with these elements the military analogy prevails throughout.

The railway army numbers approximately 1,800,000 men. Like our national army, each system must have its headquarters staff, whose duties are not unlike those performed by that arm of military service and whose personnel numbers about 300,000 men. The railways, like the army, have what is known as the combatant staff. These are the men in the transportation, the mechanical,

the maintenance and the engineering divisions; the fellows who do the fighting. But outside of these forces and paid directly by the railroads is a vast army of approximately 2,000,000 men in the service of supply for this vast railroad army. They are the men mining coal, producing lumber, manufacturing steel, building equipment and in all the other various manufacturing interests supplying material to keep these railroads running. The co-ordination of this vast transportation machine and the keeping of its various parts in step with each other are essential.

As I conceive it, this nation expects three things of the railroads:

First, that the transportation furnished shall be adequate at all times. The record indicates that in the last three years there has been no failure to furnish adequate transportation in this country.

Second, that this task be performed economically, as well as efficiently. In no period of railroad history has there been such wonderful progress or greater development in economical methods for the handling of transportation than in the past five years.

But there is also a third point, seldom stressed and never realized until confronted with a grave emergency and that is the military value of these railways to us as a nation. This demands the greatest degree of co-ordination. Few of us appreciate what a tremendous military machine this transportation system is, with its investment of private capital of approximately 23 billion dollars.

This vast machine is maintained and carried on by the investment of private capital, costing the government not one penny, receiving no favors from the government any more than any other industry, unless the right of eminent domain should be so considered, but contributing a million dollars a day in taxes for the support of the government, and yet, as I said in my opening remarks, like the arrival of a great transcontinental train, everybody seems to take it all for granted and nobody seems to think it very remarkable or seems to realize the necessity for maintaining the conditions that will enable it to be kept up to the highest point of efficiency at all times, ready for instant use as the greatest weapon of offense or defense in time of need.

But after all, I believe the American people do more and more realize the significance of transportation achievements and, provided the facts are accurately laid before them, in the end such proper recognition is bound to be reflected in the state of public opinion as regards the service rendered by the railroads.

The Western Railway Club has been a pioneer in this kind of co-ordinate and co-operative work and such associations as this one have made a notable record for getting together, not only as between the railroads, but as between the railroads, the supply people and the public generally. I can not emphasize too much the value of this effort.

One of the most notable developments of the past few years in co-operative work has been the action of the shippers through the organization of the regional advisory boards, the results of whose work have been so manifest and so beneficial alike to all sections of the country. Mr. Ross is going to speak to you regarding these boards and I will not, therefore, say anything further about them.

I want to pay my tribute to the Western Railway Club and its members for the very active part that they have taken in the education of their own membership on many of these larger transportation questions. You have done much to bring about co-operation between manufacturers and railroads. You have gained a better acquaintance with one another and the problems which each of you must face. Through your co-operative efforts and by co-operating among themselves, the railroads have been materially helped in making the striking progress which their records of the last few years so clearly disclose.

What Shippers' Advisory Boards Mean to the Railroads

By Robert C. Ross
Traffic Manager, Jos. T. Ryerson & Son, Inc.

The existence of the Western Railway Club is evidence that those who specify and purchase the requirements of the railroads and those who sell their wares to the carriers, appreciate the value of an organized point of contact of this character. Wherever opportunities are offered for those who buy, and those who sell, to get their feet under the same table, good-will is generated, knowledge disseminated, and the transaction of business facilitated. We who purchase from the railroads the transportation which they manufacture also have similar points of contact which we believe are mutually beneficial, and I am going to tell you something about certain of these shipper-carrier relationships tonight.

We have been accustomed to expect the chart of our industrial history to depict wide variations in commodity prices, and the volume of manufacture and distribution. Inadequate transportation materially contributed to this lack of stability and to the peaks and valleys of business which periodically occurred, and which were so wasteful of the capital and energy invested in our industrial machinery and organization.

There has been, however, for some time past an almost complete absence of resistance between production and consumption. The time element between manufacture and use has, due largely to fast and reliable carrier service, been cut tremendously. All will admit that this present happy condition in transportation has been responsible as much as any one factor for the absence of impediments to productive capacity, to the present easy money conditions and to the more stabilized state of industry generally which exists today.

How Adequate Transportation Has Cut Inventories

Just a few illustrations: Many of the large automobile manufacturers find that transportation service is so reliable that they can unload raw materials directly into production and eliminate large inventories in warehouse stocks formerly carried as protection against irregular movements. Some months ago a representative of the lumber industry stated that approximately $600,000,000 had been taken out of the stock account since 1923, as a result of improved transportation conditions.

Homer Loring of the Boston & Maine stated recently that the inventory value of the supplies stored for his railroad had been reduced over $2,000,000 within the past two or three years.

A large manufacturer in Pittsburgh has been able, through dependable and expedited freight service, to reduce the stock of steel which he is required to carry from $300,000 to $75,000 and other materials from $600,000 to $300,000. This means annually to this manufacturer a saving of more than half a million dollars of capital tied up in inventories of his raw materials.

There is in Toledo, Ohio, a bottle manufacturer who is reported to have cut his glass making material stocks in two and his coal stocks by two-thirds.

The effect of this improved transportation service is felt by small companies, as well as large companies. For

example, a steel products company has stated that it was necessary for it to have only $10,000 invested in materials at the end of 1925, as compared with $36,000 at the end of 1924, notwithstanding the fact that its tonnage in 1925 was much heavier than in the preceding year.

The Pure Oil Company has made the statement that, effective January 1, 1926, it would return to the owners some 200 leased tank cars which it had been using upon a rental basis, resulting in an annual saving to that company of approximately $100,000. This company has adopted this policy because of improved transportation to such an extent that it will be able to do an increased business with its own equipment.

At a meeting of the Atlantic States Shippers' Advisory Board, held in New York on April 8, 1926, the chairman of the Storage and Warehouse Committee said:

"The efficient service rendered by the carriers during last year and this year has had a serious effect on the warehouse business. That is not a complaint. That is a statement of fact. Stocks on hand have been smaller, due to the dependency that the buyer can put upon the carrier, that he heretofore has been unable to do. Inventory checkup through the bankers and warehouses shows a decreased amount of stuff in public warehouses and our questionnaire in the last six months developed the fact that it was primarily due to the service of the carrier and we are praying that the carriers are going to fall down pretty soon."

Speculative Factor in Business Reduced

This greater freedom in the flow of commerce has materially lessened price variations and thus reduced the speculative factor in business. While not altogether an unmixed blessing to the business man, as it has brought hand-to-mouth buying problems and most acute competition, the absence of speculative possibilities for profit has necessitated much more consideration to economics in operation and management, both by individual concerns and related groups. The elimination of wasteful methods, better organization, improved processes and standardization are materially contributing to our national welfare. The money to pay dividends these days is coming largely from reductions in the cost of manufacture and distribution rather than from speculation.

All wisely managed industries, and properly so, are basing their future plans on the theory that it will not be necessary to maintain surplus capacity to the same extent as has been necessary in the past to protect peak period situations. They are confident that the possibilities are remote for transportation breakdowns substantially contributing to acute ups and downs in business.

Due credit should, of course, be given to the operation of the Federal Reserve Banking System, which has materially decreased the possibilities of marked inflations and depressions. Stable industrial conditions create permanency of employment and happier employees.

Perhaps no industries have suffered more from the acute ups and downs of business than the railroads themselves, and the concerns who furnish the articles they require. Irregular traffic conditions mean irregular earnings and irregular purchases. Many of our railroads who in the past have been wont to purchase during peak conditions at high prices are now able to make expenditures as needed. We should, therefore, expect less spotty railroad buying, narrower price variations, and a steadier volume of business to supply and equipment companies, thus permitting substantial economies in manufacturing costs and plant investments.

The time of men such as your president, who are in direct control of the operation of these great arteries of commerce, is not taken up to the same extent as in the past with the giving of personal attention to individual movements and situations over their lines. The machine is functioning smoothly; an opportunity is afforded to concentrate on schemes for economies and betterment. As a result the railroads today have been doing a wonderful job in reducing their costs while at the same time substantially improving their service. Their dividends the same as ours, are largely coming from the use of more economical methods.

How has all this come about? In my judgment the fundamental reason for this improvement has been a direct right-about-face in the public attitude toward our carriers. The greatest asset of any public utility is the goodwill of the public it serves. Our railroads today are in better standing with their patrons than they ever have been. During the hectic conditions which obtained during the war and post-war periods, we learned through bitter experience the close interdependency of transportation, industry and agriculture. We found that large investments in productive facilities were nullified by inability to move the products of such machinery. In that period we harvested the fruit of a niggardly policy toward the carriers, and we came to a realization through this costly experience that the public welfare required first and foremost a reasonably prosperous and well-equipped, well-organized transportation machine and that it was good business to pay the price necessary to achieve this result.

It is probably true that the railroads themselves were largely responsible for the pinch-penny policy which led shippers to fight bitterly against every suggestion of the railroads for increased rates. In this day and age even railroad executives admit the orgy of high finance which characterized the management of certain of our systems, furnishing considerable justification for the public ill-will which was rampant for so many years. Perhaps the "high-hat" attitude of some railroad executives and employees toward the public also had something to do with this feeling.

Today almost everyone agrees that the carriers must have payment for their services which will show them sufficient net to attract the enormous amounts of additional capital and the high-grade executive ability which are necessary to maintain an effective transportation machine. It is in the distribution of this necessary bill of expense that the real problems lie. Rate adjustments are now largely controversies between shippers and localities rather than between the carriers on one hand and the shippers on the other.

From these troublous times came a broader attitude on the part of the public toward our railroad financial policies. This has permitted favorable legislation such as the Esch-Cummins law, which has been one of the factors responsible for a material improvement in the carriers' net revenues. This, together with the easy money conditions, which their own good service has aided, has resulted in railroad securities coming into high favor in our financial markets. Capital for the substantial improvements necessary in their facilities has been readily forthcoming and has been intelligently expended.

The public also learned during this high pressure period that the efficiency of carrier operation was not altogether the responsibility of the railroads, that the shippers and receivers also had obligations if we were to get the most out of our available facilities. Rapid release of cars and heavier loading whenever commercial conditions permitted, were necessary, are under the control of the shippers, and have materially aided in reducing equipment shortages.

But the shippers of the country were not the only ones to undergo an intensive education. The carriers during

the bitter experience of governmental control, and the uncertainty of their return to private operation, came to realize thoroughly the power of public opinion and the value of the good-will of their patrons. With their return to the owners, protected by the more favorable legislation I have mentioned, they determined to demonstrate conclusively that our policy of private and competitive operation was correct, and that their service would not only be prompt and reliable, but also courteous.

Another important lesson was the positive necessity for the carriers to function as a unit, to co-operate with one another in distributing equipment and in clearing up congestions. It was found that the competitive instinct as between carriers, if allowed full sway, reduced the earnings of the carriers individually and collectively, disorganized railroad service, and engendered the ill-will of the public. No matter how adequate the facilities of any railroad to handle the traffic offered, the inability of their connections to take the business resulted in congestion and extra expense to all concerned.

Instead of the shippers of the country being constantly obliged to travel to Washington to get relief from inadequate service conditions, instead of the carriers themselves at times requesting the Interstate Commerce Commission to issue orders against other roads on such matters, they determined most wisely to strengthen their own machinery, to set up their own court to handle the problems of car distribution and interchange, and to get in line in this respect at least with the slogan of the times, "Less Government in Business." As a result today the orders of the Car Service Division of the American Railway Association are strictly obeyed by the carriers of the country.

These two factors which I have mentioned have contributed most materially toward our present improved service, but there is another element which our railroad friends admit has assisted substantially in bringing about this gratifying condition. This is the co-operation of the shipping public through the Regional Advisory Boards which have been organized at the instigation of the American Railway Association as a result of other war time lessons. There are thirteen of these institutions representing the various sections of the United States.

The railroads have delegated to the Car Service Division the matter of distribution of cars as between railroads. This work in the past has been greatly handicapped by inability to procure accurate information as to car requirements. The natural tendency in times of shortage is for the shipper to order more equipment than he actually needs, and, as a result of this inaccurate information, much dislocation of equipment and empty car mileage occurred. Today the carriers are getting a quite accurate picture of this situation, with the result that cars are intelligently distributed and congestion is avoided by preventive measures taken in advance of heavy movements, which, under the old regime, would have caused congestion.

These over-the-table sessions permit of intelligent understandings of the respective problems of carrier and shipper. The carriers are learning that conference with the shippers regarding their problems frequently point the way to their solution. No longer are they inclined to take arbitrary action. Measures which may affect shippers adversely are now not decided upon without getting the views and, consequently, the co-operation of the industries of localities involved.

Insofar as service problems are concerned no longer is it necessary for a shipper, no matter how small or how transient, to suffer in silence, or take his troubles to governmental agencies for relief. The way is now open through these organizations for common-sense across-the-table discussions aimed toward the adjustment of such difficulties.

Many of the problems which are now being tackled by the boards go considerably beyond those phases which are here discussed. Orderly marketing of agricultural products is one of them. Owing to information provided by the railroads of cars on hand at markets, in transit and on order, shippers of certain products in certain localities have been able to arrange a more regular flow of movement, avoiding market gluts and wide price variations. The opportunities of service in this respect are extraordinary, and in time will revolutionize the marketing methods in many lines of industry and agriculture.

One of the most important results of these organizations at their quarterly conferences with the carriers is the excellent effect on the personnel of the carriers. Operating problems only are discussed. Consequently, the carrier representation is largely from the operating departments. Their contact with the shippers has given the operating man a commercial viewpoint; it is building up in him a greater pride in the road which employs him and a determination to impress his customers with the excellent brand of service which his road is giving.

In fact it might be stated that, as a result of the board movement, the shippers are simultaneously receiving the benefits of competition and monopoly, because these meetings constantly bring forth the fact that not only must the individual railroads give good service in order to compete with other lines, but also that they must work together with their competitors and connections. They are learning that if the machine is to function properly a helping hand in the way of cars and motive power to alleviate temporary embarrassment is to the advantage of all.

Whether or not such a result were contemplated, board operation is placing the full force of public opinion back of the programs and orders of the Car Service Division with respect to interchange and car distribution as between carriers. All the cards are laid on the table at these meetings, and the fact that any carrier fails to play the game with the other carriers cannot help but become known to its patrons.

I wish to take this opportunity, Mr. Chairman, to pay a well deserved tribute to R. H. Aishton, your honored guest tonight, to M. J. Gormley, chairman of the Car Service Division, and to Donald Conn of the Department of Public Relations, who originated this unique but intensely practical method of improving shipper-carrier relationships.

Present Basis of Rate Adjustments Impracticable

Unfortunately, there is a big black smudge on this otherwise almost perfect picture, and that is our method of adjusting rate problems. Regardless of who is at fault, it must be admitted that the carriers have largely lost control of rate making. We have unloaded practically this entire burden upon the government agency. Competent and hard working as is this body, the task is impossible. Experience has proved that it is entirely impracticable and out of the question satisfactorily to adjust matters affecting the charges for the service of the carriers within the realms of formal litigation. Today practically every general rate basis is under fire or frozen up.

This uncertainty is a tremendous handicap to business and many projects do not go forward on account of it. The public is very much dissatisfied with the present method of handling these matters. While it is granted that it is much less difficult to adjust serious problems co-operatively, there is no question in my mind that the satisfactory results obtained by so doing indicate that there are great possibilities of similarly handling rate matters,—not, however, through the medium of the

Advisory Boards. The peculiarities of their form of organization prompts the conclusion that their activities should be confined strictly to service and related distribution problems. However, I am confident that the time is not far distant when formal rate cases will be materially reduced; when governmental agencies will act as arbitrators rather than judges and that the long periods of uncertainty which now confronts us will be curtailed. When this condition obtains there will be a still further enhancement of the public good-will toward the carriers and the more flexible businesslike rate structure which our ever-growing commerce requires and demands. I most earnestly commend consideration of this important subject to the carriers.

Lakes Board Meets at Detroit

FREIGHT rates should always be reasonable but, with honest and intelligent management, shippers have a great deal more to gain by adequate facilities than by inadequate rates," according to W. W. Atterbury, president of the Pennsylvania, at the annual meeting of the Great Lakes Regional Advisory Board held at Detroit, Mich., on May 13 and 14. The meeting was attended by 24 railroad presidents and the total attendance included 800 men representing shippers and railroads. Besides the presentation of the reports of committees, Car Service Rule, No. 12, which prohibits the placing of advertisements or banners of any kind at any time upon passenger or freight cars or locomotives and the transfer of carload shipments en route, were discussed. Frank H. Alfred, president and general manager of the Pere Marquette, spoke upon "The Leavener of Transportation."

General Atterbury said, "The great quality of the plan of the regional shippers' advisory boards is that they are dealing with the problem of railroad service and facilities upon the theory that railroad managements are competent and are doing the best they know how, and that the assistance of these shippers' boards will be of great constructive value rather than constitute an interference. When our government first undertook seriously to regulate railroads, it was done in a punitive spirit. The feeling seemed to be that the railroads did not need guidance and co-operation with the government, but what was vitally necessary was the correction of railroad faults and punishment for railroad sins. Fortunately, we have gotten a long way from that spirit. Today I feel that the governmental authorities are approaching the whole problem of utilities regulation in a constructive spirit. By the methods of your regional boards the railroads get the benefit of your large experience and the wisdom growing out of that experience. It is because of that spirit that we are getting somewhere, and bringing the railroads and the shippers into more direct contact. This is not a mere generalization. It is reflected in a very definite boon to the business man and to the financial strength of the country.

"I am a believer in the theory of public regulation of business affected with a public interest, but I feel that it is incumbent upon business men to so conduct their affairs as to make the necessity of governmental intervention just as infrequent as possible. These regional boards, and the rail representatives meeting with you, are seeking so to elevate the spirit and tone of all business relationships as to obviate the occasion for governmental intervention. The progress of this same general theory is illustrated by the Watson-Parker bill recently passed and now under consideration by the President. Some years ago it was considered that the interests of the railroads and their employees were mutually antagonistic. That view has been exploded. The Watson-Parker bill provides for the settlement of disputes through a general plan which presupposes an expectation to agree and not an expectation to fight. There is no more hopeful augury for continued business health in the United States—particularly at a moment when we see so much strife in other parts of the world—than this tendency toward mutual confidence. I do not believe in peace at any price, but I do believe that the great majority of men are honest and square, and no matter what diversity of interests may be at stake, if men approach their discussions in the right spirit they will generally arrive at an agreement."

Mr. Alfred said in part, "It is this body, acting as a leavener, that has been instrumental in paving the way for the creation of the regional advisory boards that have been established throughout the length and breadth of the land. It is difficult to predict what would have been the status of the weaker railroads, and of the relation between these railroads and the shippers located thereon, but for the assistance through the Car Service section.

"You no doubt have observed the keen competition that has recently become so intense among the carriers. The railroads are vying with each other to do your bidding. Those who control the routing of traffic of the large industries are, without question, the czars of the situation. Competition is the life of trade. I am not deluding myself that wholesome competition is not to be desired and that good service should not be rewarded. I contend that reason should enter into the demands of the shippers; that railroads should not be required to furnish a service not warranted by the class of the commodity to be shipped. Every dollar spent in extra cost of providing a service beyond that which is essential for the proper handling of the business, makes necessary a higher freight rate and passenger rate, which is generally spread over the entire consuming and traveling public.

"As representatives of various businesses which are dependent upon the railroads as the railroads are dependent upon your institutions, you have taken a step far in advance of the business men of any other country. You are entitled to much credit for this far-seeing policy and I believe that it has been of mutual benefit. You have set a new standard of business. I conjecture from the relations which exist between the railroads and the shippers that the same spirit pervades in those relations which exist between similar businesses. It has also been profitable to you inasmuch as you have not been obliged to carry large stocks."

New Haven Valuation

WASHINGTON, D. C.

ORAL argument was heard on May 17 by Division 1 of the Interstate Commerce Commission, Commissioners Meyer, Aitchison and Lewis, on the tentative valuation report on the New York, New Haven & Hartford as of 1915. A. P. Russell, vice-president of the New Haven, stated its claim of $532,000,000 for the used carrier property, on which the commission placed a final value for rate-making purposes of $383,000,000. Including non-carrier property and $75,000,000 for rights in various terminals the New Haven's total claim was $630,000,000, some of which had been included in reports of other companies.

The point on which most stress was laid was the claim of the New Haven for $55,000,000 for its rights in the Grand Central Terminal at New York, under its perpetual lease of the right to use up to 50 per cent of the

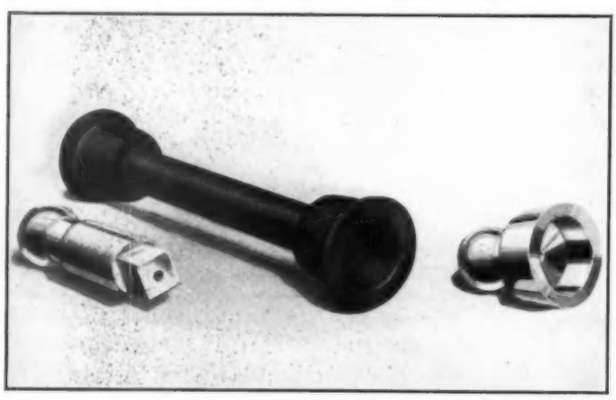
capacity. The amount claimed was based on the proportion of actual use to a total value for the terminal property of $129,000,000. The argument on this point was presented by Charles Evans Hughes, who contended that the New Haven has an actual property right as a joint owner and that the commission had no right to value the property as that of the New York Central, except as subject to the New Haven's rights. He laid great stress on the perpetual character of the lease, saying that it runs to any successor of the New Haven in the ownership of its present railroad and that there is no reversion.

Charles W. Needham, solicitor of the Bureau of Valuation replied to Mr. Hughes apologizing for having dealt rather lightly with the point in his brief. He said however, that the commission had uniformly included property in which another carrier had a right of use in the valuation of the owning company, to avoid duplication, and that its practice is to refer to such use in the report of the using carrier. In a valuation for capitalization or for consolidation, he said, there would have to be a valuation of the right. When Commissioner Aitchison asked whether the other cases referred to involved the question of perpetual rights as in this case he replied that he could not say. He also took the position that the New Haven's right is of the nature of a trackage right and that the New York Central should be considered as the owner and the company required to perform any construction work and that the New Haven pays a rental.

Other features of the case were argued by A. B. Blackman, assistant valuation counsel of the New Haven, and Crowley Wentworth, for the Bureau of Valuation.

Pitkin Articulated Staybolt

WHEN the rigid type of staybolt was most generally used breakage was found near the outer sheet. This condition was because of the fact that the outer sheet, being heavier, held the end of the bolt in a rigid position, thereby throwing the greater strain on the bolt at its junction with this sheet. The

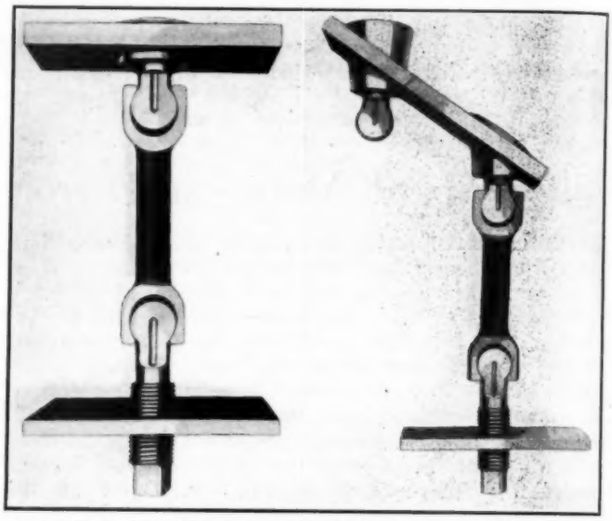


This View Shows the Middle Member with its Two Sheet Connections Before Assembly

inner sheet, being of lighter weight, took up some of the strain by bending, thus partially relieving the bolt at the inner rigid connection.

This is the condition that brought about the development of the flexible stay bolt. By the use of a flexible ball and sleeve type bolt the strain at the outer sheet was greatly relieved. However, the slightest movement still throws a strain on the thin inner sheet. The continued uneven expansion and contraction of the inner and outer sheets constantly changes their position in relation to each other. This movement causes the bolt to "bell" the hole on the water side, thereby exposing the thin threads to the oxidizing effect of the water.

The scale that forms around the bolts is also broken away by this weaving motion and fresh surfaces are exposed for attack. In time minute checks or cracks appear radiating from the bolt and finally the sheet is materially eaten away immediately around the bolt connec-



At the Left May Be Seen a Partially Sectional View of the Bolt Showing the Reinforced Bearings in the Ends of the Sockets—The Right View Shows a Staybolt Applied to a Sheet with a Maximum Slope of 32 Deg.

tion. This process continues until it becomes necessary to replace not only the bolt but also the sheet.

To relieve this condition it is necessary to provide means whereby the bolt connection to the firebox sheet can be held rigidly fixed therein and still have no weaving or bending strains set up at this point. In order to accomplish this result The American Locomotive Company, 30 Church Street, New York, has developed the Pitkin articulated staybolt.

One of the illustrations shows a partially sectional view of the bolt in order to show the reinforced bearing faces in the ends of the sockets as well as the expansion spaces in the sockets over the balls. Expansion stays have larger expansion spaces over the balls than water space bolts.

The connection at the outer sheet is a hollow tapered plug with a tell-tale hole drilled into the ball. A tell-tale hole is also drilled through the center of the inner threaded connection into the ball at this end of the bolt. The main bolt body and sockets are made substantially stronger than the end connections into the sheets, so that if a break should occur, it would be immediately apparent through one of the tell-tale holes in the end connections.

Any movement of the articulated bolt body will only cause it to rotate around the ball located close to the thin sheet. By thus taking up the flexing strains set up by the relative expansion and contraction in the wrapper and inner firebox sheets, the life of the firebox sheets should be prolonged. As the actual movement between the outer and inner sheets is slight, the angular pull on the inner ball connection of the bolt is considered of no practical importance. This slight movement, however, will be sufficient to keep the joint free from the scale deposit which in some cases has transformed the semi-flexible into solid bolts.

A. R. A. Plans for Record Business This Fall

Preliminary steps to get the railroads of the country in readiness to handle, without transportation difficulty this fall, what is expected will be the heaviest freight traffic ever offered to them were taken at a meeting of the American Railway Association in Chicago on May 20. The Car Service Division reported that as far as the physical condition of equipment is concerned, the railroads are now in the best shape they have been at this season of the year for the past four years.

"Advance crop estimates for 1926," it said in its report, "indicate that the transportation problem this fall will be greater than heretofore. Winter wheat prospects in the southwest are reported to be never better at this season of the year. Satisfactory handling of this crop will require the greatest possible co-operation between shippers, receivers and the railroads in the prompt movement of empty cars and their loading and unloading, without delay.

"Adequate provision for the proper handling of bituminous and anthracite coal constitutes another major transportation problem for the railroads.

"The absence of car shortages and the repeated statements by shippers of satisfactory car supply in all parts of the country, show clearly that the carriers are now affording satisfactory distribution to meet transportation demands. An important element in making this satisfactory condition possible is the work of the various shippers regional advisory boards that have been organized throughout the United States.

"The Car Service Division estimates that 51,175,669 cars will be loaded with revenue freight during the year 1926. This is only 2,293 cars below the number actually loaded in 1925, when the total was 51,177,962 cars, the greatest number ever loaded during any one calendar year. On the basis of the estimate for 1926, freight traffic for the year should prove to be an increase of 2,641,236 cars, or 5.44 per cent over 1924.

"Early in March, the Car Service Division estimated revenue freight car loading for the first 18 weeks this year—that is, from January 1 to May 1, inclusive—to be 16,555,576 cars. The actual loading for that period amounted to 16,777,076 cars, an increase of 221,500 cars, or 1.3 per cent over the estimate.

"While fall traffic, due to an anticipated heavy crop and fuel movement, is expected to establish a new peak, some slight diminution in traffic compared with 1925 is expected during the summer months.

"In view of the heavy crop movement this fall, we call attention to the:

1. Necessity for early conditioning of grain cars to meet the requirements;
2. Necessity for eastern and southern railroads specializing on return to western lines of box cars owned by those lines;
3. Necessity for western lines utilizing freight cars belonging to other roads for off-line loading to greatest possible extent so that they can hold their own cars for grain movement;
4. Necessity for careful survey of car repair situation with a view of adoption of car repairing program as conditions on each railroad may justify.

"We recommend to shippers that they study their own situation with a view of bringing about the heavier loading of freight cars in the interest of car efficiency and reduction in amount of equipment required and that particular attention be given by all railroads to observance of the car service division rules in the large grain terminals, so as to insure prompt return of empty cars to delivering line. The observance of this rule will keep grain cars in grain districts and will accomplish more than any one thing to prevent any shortage, the car service division forces will also give preferred attention to this during the grain movement season."

The board of directors of the association reported that Fairfax Harrison, president of the Southern, and W. R. Cole, president of the Louisville & Nashville, had been elected members of the board to succeed the late Julius Kruttschnitt and W. L. Mapother, and that J. M. Davis, president of the Delaware, Lackawanna & Western, had been elected to succeed W. H. Truesdale, who resigned. L. W. Baldwin, president of the Missouri Pacific, has been appointed the member of the board of directors for the engineering division, succeeding Mr. Kruttschnitt.

The board reported that 363 members had voted in the affirmative and only two in the negative in response to a suggestion that "Head-on Collisions" for spectacular and moving picture purposes be discouraged. The Interstate Commerce Commission on January 4, 1926, issued an order for a general investigation concerning the rules for settlements for the use and detention of freight cars while on the lines of carriers other than their owners. A committee of counsel of which W. F. Dickinson, general solicitor of the Rock Island, is chairman, has been appointed to take charge of the defense of the code of per diem rules, and a transportation committee of which C. W. Crawford of the transportation division of the American Railway Association is chairman, has been appointed to co-operate with counsel.

Capital Expenditures for 1926 Estimated at $750,000,000 to $800,000,000

Class I railroads up to April 1 of this year had authorized capital expenditures for new equipment and other improvements amounting to $822,000,000, according to a report submitted by the Bureau of Railway Economics to the board of directors of the American Railway Association.

This is based on replies received by the bureau to questionnaires sent by it to all Class I railroads. Authorizations during the first three months this year exceed by approximately $60,000,000 those for the corresponding period last year. Of the total, $166,000,000 was actually expended for capital improvements during the first three months, which was slightly less than similar expenditures for the corresponding period in 1925.

Of the $822,000,000 so far authorized, $467,000,000 represents unexpended authorizations carried over from 1925, while $355,000,000 represents additional authorizations. The bureau estimates that the total capital expenditures for 1926 will run between $750,000,000 and $800,000,000.

A comparison of expenditures actually made during the first quarters of 1925 and 1926 shows a decline in the total of equipment purchased but all other classes of capital improvements showed increases.

Capital expenditures for equipment amounted to $74,900,000, a decrease of $22,800,000. Expenditures for locomotives amounted to $18,300,000, an increase of $5,600,000, but decreases were reported in expenditures for freight and passenger cars.

For roadway and structures, capital expenditures for the first three months amounted to $90,800,000, an increase of $19,200,000. Of this, $39,900,000 represented expenditures for additional track, heavier rail and additional ballast, an increase of $11,400,000. There also was an increase in expenditures for shops and engine houses and other improvements.

A Century of Railroad Service

HOWARD ELLIOTT, chairman of the Northern Pacific, speaking at Pennsylvania State College on the occasion of the annual industrial conference there, May 11, discussed the part which had been played by the railroads of the country in the unparalleled progress of the last 100 years.

The great service performed by the railroad, said Mr. Elliott, was not alone to bridge time and distance; a still greater service was to furnish the means of originating power and raw material in great quantities, using only a small part of the man power of the country. Today by means of the steam locomotive there are being handled by less than 2,000,000 men, more than 400 billion ton miles of freight each year. The physical effort to do this represents the labor of about a billion and a quarter men; and the cost to the public has decreased from about $3 [for transportation in the 18th century] to 1.1 cents per ton per mile. This great development permits almost two-thirds of the population to be sustained without any direct contact with the soil. The railroad system of a modern country determines the extent to which highly specialized subdivision of man power and great production at a maximum economy can be obtained.

Other forms of transportation have a field of usefulness in giving supplemental service, but the amount of transportation needed by industry that they can produce per man employed is, except in the case of water, much less than on the railroad, and to that extent they are less economical for society as a whole. The great public utilities of our cities and the great machine industries today carry on the process started by the railroads in the mass production of power and raw material. The railroads carry about ten times as much business per inhabitant as do the railroads of Europe and three times as much per person as was required in this country only 20 years ago.

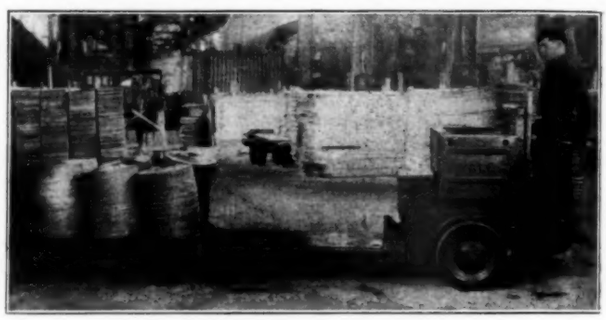
In 1880, when the population of the country was about 50,000,000 its economic activity was represented by 32 billion ton miles of freight transportation. In 1925 the country had a population of 115,000,000 and its activities were represented by 416 billion ton miles of freight transportation. In these 45 years the railroads increased their freight service thirteen times. But in doing this they multiplied their investment only five times. The way to cheapen railway transportation is not to multiply its competitive agencies: it is to increase the volume of business to be handled by the great mass producer of transportation—the railroad—because it has shown a constant ability to use increased volume to diminish unit costs. Modern economic society is built upon the foundations supplied by the railroads and society will help itself best by giving to them all the business which economically belongs to them and allowing this great servant of all the people a "living wage."

THE VERMONT MAPLE SUGAR SPECIAL is the title of a train, carrying 100 or more citizens of Vermont, including Governor Franklin S. Billings, which is making an extended tour to advertise the state as an attractive summer resort and also to set forth the industrial importance of the state. The train started from Burlington on May 17, was in Boston on the 19th and in New York May 20. Three cars contain exhibits featuring the agricultural and industrial arts. There is a large quantity of maple sugar, which is to be offered for sale; and at Washington a gift of sugar is to be given to President Coolidge. In New York elaborate entertainments were given by the City, the Merchants' Association and the Vermont Society.

A New Elevating Platform Truck

A NEW elevating platform truck, designated as Yale K, 23, E, has been brought out recently by the Yale & Towne Manufacturing Company, Stamford, Conn. It is designed primarily to carry unusually heavy loads and while it is not of the light lift type it embodies the self-loading feature and the rapidity with which it is said to pick up or drop skids results in quick operation with consequent economy of time. The truck is narrow and has a short turning radius, enabling it to be easily handled in or out of cars or narrow aisles.

The frame is made up of heavy pressed steel members, while the elevating links which support the platform are wide and heavy, supporting the platform securely and providing an ample factor of safety for carrying the load. The tires on both the front and rear wheels are large, and the design of the truck is such as to distribute the load properly to the wheels. The elevating mechanism consists of a triple spur gear with essentially the same



The Yale K23E Truck About to Pick Up a Load

unit as is used in the same company's K-22 truck, making the major replacement parts interchangeable between these models. The elevating platform is raised by means of two large eccentrics mounted on the hoist unit shaft, which move the platform forward and upward on the links. Mechanical upper and lower stop limits are provided, assuring simple and safe operation of the lift mechanism.

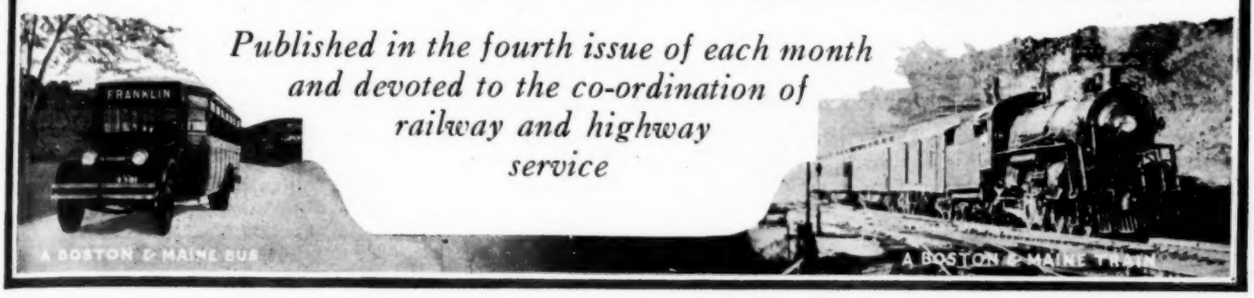
The power axle is a spur-geared unit. The gears are of alloy steel totally enclosed, mounted on ballbearings and running in oil. The universal joints are enclosed in leather boots packed with grease, thus protecting them from dirt and water. The steering pivots are of hardened steel with bronze bushings, and a high pressure lubricating system is provided, insuring easy steering, even with a full load. The control of the truck follows the Yale standard and the controller is the same as used on all Yale industrial trucks. All parts of the truck are designed for easy accessibility and the majority of units and sub-assemblies are standard and interchangeable with those of all other models in the K series.

A JOINT MEETING of the Chicago Shippers' Conference and a number of railroad freight claim agents was held at Hotel Sherman, Chicago, on May 19. Matters of mutual interest were discussed.

THE TRAVEL to the Pacific coast this spring on reduced rates has been heavier than that of last year. On the Santa Fe, March 13-18, the California Limited had a total of 13 sections and extra cars were added to other trains. The Rock Island, on each of four days, ran two extra trains out of Chicago and two others out of Kansas City. The Rock Island in this time ran 12 trains eastbound.

MOTOR TRANSPORT SECTION

Published in the fourth issue of each month and devoted to the co-ordination of railway and highway service



B. & M. Buses Improve Rail Service

Train stops eliminated and all schedules quickened—Seek to win passengers from their own automobiles

THE Boston & Maine on April 25 instituted a comprehensive plan for the improvement of passenger service characterized by speeding up of virtually all of the 660 trains which it operates. Savings in time under the new schedules vary from one minute to an hour and a half. The speeding up was made possible partly by slightly faster running time, but mainly through the curtailment of local stops. The curtailment of these local stops was, in turn, made possible in some cases by the installation present or proposed of motor bus service on the highways.

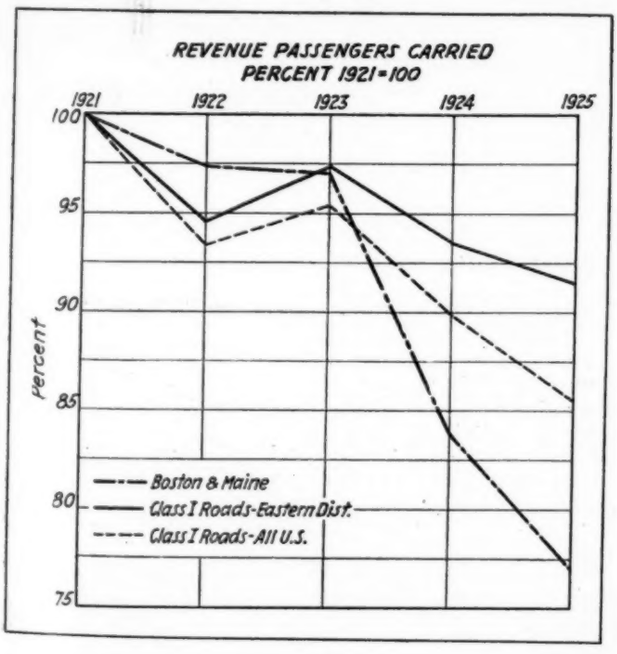


Fig. 1.—The Boston & Maine's Problem—A Decline in Traffic Far More Serious Than That of the Average Road

Schedule of Every Train on the Road Examined

This sweeping change was not, of course, effected without considerable study. A committee composed of the general passenger agent, the then general superintendent of transportation (now general superintendent), and a train dispatcher especially assigned for service on this committee. A count of all passengers on and off at every station was made for a whole week in March and an average taken, followed by a similar count in April. The committee had definitely in mind what it desired to accomplish, i.e., improve schedules, with a realization that it would mean a drastic reduction in the number of stops. However, it was not possible to take away service from many stations even where a stop was not economically justifiable from the railroad standpoint. Where the curtailment of train stops desired could not be secured without working evident hardship on patrons routes for motor buses were planned and applications filed with public service commissions and other interested authorities for permission to establish highway service.

It was found possible to eliminate many stops without providing otherwise for handling passengers at these stations.

For example, many stations are quite close together so that taking service away from one of them would not seriously discomfort the passengers. Especially is this true in the case where local trolley or bus lines provide easy transportation to the station. One city, and not a very large one at that, has eight B. & M. stations (five within three miles)—far beyond its pressing needs.

Believes Railroad Can Compete with Private Automobile

The Boston & Maine is making a sincere and thorough attempt to attract passengers away from the highways to its trains. It is realized that the most serious competitor is the private automobile. The road acknowledges that it cannot compete with the private automobile in the case of an individual who wishes to cruise about in a leisurely fashion. On the other hand it believes that by speeding up its service and making it more attractive to the passenger it can win back a large number of those persons who want to get somewhere quickly in comfort and safety.

Some idea of the seriousness of the situation which confronted the Boston & Maine may be gathered from the following percentages of passengers carried and train miles run, with 1921 taken as 100 per cent:

Year	Passengers Carried	Train Miles
1921	100	100
1922	97.3	96.3
1923	97.0	98.2
1924	83.8	98.4
1925	77.1	96.1

Better Service on One Line Brings Increased Business

In the period from 1921 to 1925, therefore, when passengers carried on all class I railroads declined 14 per cent and on eastern roads 8 per cent, the Boston & Maine suffered a decline of 22.9 per cent. These conditions are shown graphically in Fig. 1. As against this loss in business the figures show a reduction of only 4 per cent in service. That the present plans give hope of success is indicated by the fact that the placing in service last fall of a single fast limited train between Boston and Portland, the "Pine Tree Limited," brought a prompt increase in business on this line. Since this train has been in service all Boston-Portland business has increased 10 per cent, whereas business over the whole system has declined from 4 per cent to 6 per cent in the same period. The question which occurs to the management, therefore is, "If better service will increase business on this line, why not improve service over the whole railroad?" This question the road is answering in its program of improved service.

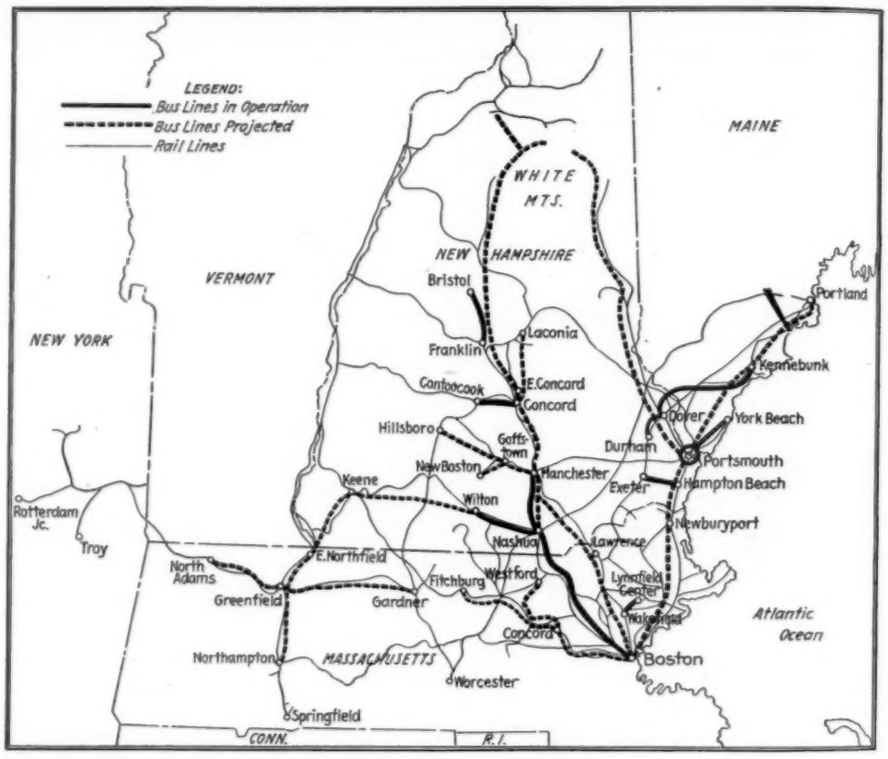
On April 25, when the general speeding up took place, new trains were put in service between Boston and Montreal and each one of them was given a name and operated at a schedule greatly reduced over the train it succeeded. On April 26 a new fast named train, the "Flying Yankee," was put in service between Boston and Portland to serve as a companion train to the Pine Tree Limited between these cities, but over a different route.

Better Service Draws Wide Attention

Judging from the New England daily papers, these improvements have attracted wide attention and favor from the public. Many columns have been devoted to describing and extolling the improvements and the highest public officials have officiated at the initial journeys of several of the new named trains.

How the Traffic Study Was Made

The program, however, is not complete, since some permits for the installation of motor bus service have not been approved as yet by the proper authorities and pending this approval trains are being operated in certain cases with the old stops. The routes of the Boston & Maine Transportation Company buses now in operation and proposed are shown in Table 1.



The Boston & Maine and Its Bus Lines

The officers in charge of the task of studying the problem of increasing train speeds knew in a general way what they desired to do and how much improvement was possible in individual instances by higher running speeds alone. As they considered each individual train they knew also how much in all they wished to reduce its schedule and how many stops could be eliminated as an aid to effecting the desired improvement. The traffic count

Portsmouth Garage (left) and Fleet

helped in individual instances by showing immediately the stations where business was almost at the vanishing point and where stops would be eliminated without much discussion. At other stations where there was relatively little business, the committee, knowing that there was another station nearly or perhaps trolley or bus service to another station, was able to do away with the train stop without much further consideration. However, such arrangements as this did not allow the abolition of all stops necessary to bring the desired improvements in train speed; some stations still remained with enough business to bring strong protests if train stops were curtailed. In such cases bus operations were planned and requests for authority to operate filed with the proper public authorities.

Then, to make doubly sure that no stops had been eliminated without justification due to slack business or passengers otherwise provided for, a form containing information as follows was drawn up for each station, the two directions shown separately:

..... STATION

Train No.	Time		Daily Avg. Pass.		Time Saved from Boston	Provision for Protecting Passengers
	Old Schedule	New Schedule	On	Off	.....	.....

From data shown on these sheets a master sheet for each division was made up giving the following information:

Last Year's Time Table					New Schedule					
Train No.	From	To	Leave	Arrive	Train No.	From	To	Lv.	Arrive	Stations Eliminated	Time Saved

Some idea of the extent to which service has been improved to individual points is given by the figures shown in Table 2—improvement made possible in a large proportion of the cases by the installation, actual or projected, of motor bus service.

Better and More Attractive Equipment

The road's improvement in its passenger service has, however, not been restricted merely to faster schedules. Better service from the standpoint of equipment and frequency is also being given. Mention has already been made of the Pine Tree Limited, the inauguration of which last fall brought the increase of traffic on the Boston-Portland route. In addition to this train the road with its new time tables also placed in service another Boston-Portland train following a different route and likewise reducing the time considerably. This train was christened the Flying Yankee and, like the Pine Tree Limited, has modern all-steel coaches and up-to-date Pullman chair cars, which latter have been rather scarce in Northern New England until recently. The appeal of these trains is directly to the driver of the private automobile: "Leave your car at home. Avoid the strain of driving. Travel quickly and safely on The Flying Yankee"—so reads the advertisement. With highway travel becoming increasingly hazardous, slow and unpleasant for the average driver of a private automobile by reason of road conges-

TABLE 1

	Route miles
Portsmouth City (3)	About 20
Portsmouth, N. H., to York Beach, Me.	13
Boston to Manchester, N. H.	57
Concord, N. H., to Contoocook, N. H.	11
Concord, N. H., to East Concord, N. H.	3
Franklin, N. H., to Bristol, N. H.	13
Wakefield, Mass., to Lynnfield Center, Mass.	4
Dover, N. H., to Durham, N. H.	5
Nashua, N. H., to Wilton, N. H.	16
Dover, N. H., to Kennebunk, Me.	33
Exeter, N. H., to Hampton Beach, N. H.	12
Total	187
Proposed Routes	
Boston to Portland, Me.*	110
Boston to White Mountains*	190
Portsmouth, N. H., to Newburypoint, Mass.	19
Manchester, N. H., to Lawrence, Mass.	27
Manchester, N. H., to Nashua, N. H.	16
Manchester, N. H., to Hillsboro, N. H.	34
Manchester, N. H., to Concord, N. H.	18
Keene, N. H., to E. Northfield, Mass.	27
E. Northfield, Mass., to Northampton, Mass.	33
Greenfield, Mass., to Gardner, Mass.	39
Greenfield, Mass., to North Adams, Mass.	36
Westford, Mass., to Concord, Mass.	10
Keene, N. H., to Wilton, N. H.	41
New Boston, N. H., to Goffstown, N. H.	5
Concord, N. H., to Laconia, N. H.	27
Fitchburg, Mass., to Boston, Mass.	50
Total	682
Grand total	869

*Interstate operations which were run last summer and will be run this summer. No permit required.

TABLE 2—SOME INSTANCES OF IMPROVED SERVICE

	Miles	Saving in minutes
Boston and Manchester	55.7	1 to 19
Boston and Bellows Falls	113.8	7 to 40
Biddeford and Saco	99.3	1 to 18
Boston and Waltham	9.9	1 to 17
Boston and Wakefield	9.9	1 to 15
Boston and Salem	16.3	1 to 16
Boston and St. Johnsbury	187.3	up to 48
Boston and Rochester	77.0	up to 64
Boston and Portsmouth	56.9	1 to 32
Boston and North Adams	142.4	1 to 72
Boston and Newburyport	37.3	1 to 20
Boston and Nashua	39.8	3 to 14
Boston and Lynn	11.6	1 to 15
Boston and Lowell	25.6	1 to 17
Boston and Keene	95.8	up to 33
Boston and Haverhill	32.9	1 to 26
Boston and Greenfield	105.6	7 to 64
Boston and Gloucester	29.6	up to 21
Boston and Gardner	64.7	1 to 42
Boston and Fitchburg	49.6	1 to 37
Boston and Dover	67.1	1 to 21
Bellows Falls and Springfield	84.0	10 to 38
Brattleboro and Springfield	60.3	4 to 23
Worcester and Nashua	45.9	up to 10
Northampton and Springfield	17.1	2 to 13
Springfield and Greenfield	36.1	3 to 19

of Boston & Maine Buses

tion and the growing number of heavy vehicles, it is believed that the railroad by improving its service has a real appeal with which to approach the motorist, especially for distances of upwards of 50 miles where the time element in fast railroad service begins to tell.

Other Fast Named Trains

Other new named trains placed in service by the Boston & Maine are the "Minute Man," between Boston and Troy with through service to Chicago in association with the "Lake Shore Limited" of the New York Central; and between Boston and Montreal the "Red Wing" (with the Canadian Pacific) and the "Ambassador" (with the Canadian National) (each of which cuts off 2½ hours from previous schedules), the "Allouette" (with the C. P. R.), the "New Englander" (with the C. N. R.), the "Mount Royal" (with the Rutland) and the "Green Mountain Flyer" (with the Rutland).

All of these trains were placed in service with extensive advertising and publicity effort on the part of the railroad, which realizes that the success of its program depends upon informing the public of what it is doing. Newspaper men and prominent citizens were present on the initial trips and the activity of the railroad was widely praised in the press of the section.

Mention has been made of the improved equipment in use on some of the trains. Other improvements have been made or are being made. The company's locomotives have been brought to a high standard of maintenance and appearance. Cars in the Montreal service in conjunction with the Canadian Pacific were painted Tuscan red, instead of the conventional dark green, in order to make them uniform with Canadian Pacific equipment. The company has embarked upon an extensive program of electric lighting its suburban cars, many of which have heretofore used gas. The program involves some 600 cars and 200 locomotives, since for this equipment all lighting will be cared for by a generator on the locomotive.

Extensive Excursion Program

Nor will the efforts to attract passengers back to the rails stop here. Last summer the company made some experiments with excursion service which suggested a possibility of much further development in this field during the coming season. Accordingly for this year some 200 excursions are projected, about one-third of which will be run from outlying points to Boston and return. Others contemplated are:

25 or 30 to Old Orchard
25 or 30 to Revere Beach
8 or 10 to Lake Winnepesaukee
10 to Montreal
3 to Quebec
1 to Niagara Falls

This figure represents about four times as much excursion service as was offered last season when 47,248 excursion passengers were carried.

Passengers Leave Automobiles at Home to Ride Trains

It will be noted that in by far the majority of cases this excursion service involves relatively short distances which could be easily covered by private automobile. The company found, however, on inquiry last summer that many of its short-distance excursionists were owners of private automobiles who preferred train service at attractive rates to driving their own cars, especially to points of great highway congestion such as seaside resorts offer on Sundays and holidays.

Motor Bus Integral Part of Program

The motor bus is an integral part of all this program of improvement, which could not possibly have been undertaken without it. The company's policy with its buses is to use them to curtail losses in passenger train service and to help in improving the service. From this point of view a bus may be operated at an actual loss and still make money or save money for the railroad. However, as a matter of fact, the bus operations last season, when relatively few were operated, paid their own way, so that all the savings in curtailed train movements were so much net. In the months of severe winter when the operations were restricted there was a slight loss, but not enough to counterbalance the results of savings from reduced train service. On the other hand this year with more buses in operation it is hoped that a profit on an annual basis will be shown.

There are two operations which are not operated directly in connection with train service, i.e., that to the White Mountains and Boston to Portland, where the company in the summer months operates buses in competition with other motor coach lines paralleling its trains. These operations are interstate in character and were undertaken in order to compete with the independent operators. In other words, the company will where possible maintain the integrity of its service in its territory against outside competition.

Use of Rail Motor Cars

As a means of reducing the cost of train operation in places where traffic is too great or where other reasons obtain which do not warrant the substitution of highway service for trains, the company uses rail motor cars. Comparative costs of rail motor cars and bus service are difficult to obtain, since it is almost impossible to allocate accurately to a rail car its proper proportion of investment charges in roadway and structures and in their maintenance. With the bus, on the other hand, roadway investment and maintenance are taken care of by taxation, to which the railroad contributes in large measure, it is true; so it is relatively a simple matter to figure the total cost of bus operation per mile run. If all charges on bus operation—wages, taxes, fuel, maintenance, depreciation and interest on the investment—are compared with similar charges for rail car (but with no roadway and structures charge to compare with the special taxation of the highway vehicle) the rail car will be found to cost about twice as much per mile operated as a bus. Depreciation on motor buses the company figures on the basis of a five-year life, although it is realized that subsequent experience may cause this figure to be changed.

TABLE 3—RAIL MOTOR RUNS

			Daily mileage
Motor 101	without trailer	Milford-Greenville	95.6
Motor 120	with trailer	Wolfeboro Branch	72.0
Motor 121	with trailer	Salem to Lowell, etc	113.4
Motor 122	with trailer	Troy-No. Adams	128.6
Motor 123	with trailer	Lowell-Lowell Jct. and Ayer.	
	Weekdays		83.4
	Sundays		68.0
Motor 124	with trailer	Boston-Fitchburg	99.2
Motor 125	without trailer	Concord-White River Jct. (bus trip).	139.2
Motor 126	with trailer	Rochester-Portland	105.4
Motor 150	with trailer	Fitchburg-Boston	99.2
Motor 151	with trailer	Concord-Worcester	126.1
Motor 152	with trailer	P. V. Branch	86.4
Motor 170	with trailer	Plymouth-Peterboro	192.2
Motor 171	with trailer	White River Jct.-Claremont Jct.	252.6
Motor 190	with trailer	Springfield-Northampton	171.0

Table 3 shows the schedules operated by rail motor as of April 25. It will be noticed that Motor 125 is assigned to run temporarily in place of a motor bus due to bad highway conditions.

North Station, Boston, is the center of the Boston & Maine's passenger business. Of its 36,000,000 passengers handled per annum, 26,000,000 or 72 per cent enter and leave this station. Of the road's 660 passenger trains,

360 enter or leave North station. Naturally, a large part of this business is suburban in character and approximately 60 per cent of all the Boston & Maine's passengers are handled at reduced rates. The road is experimenting with the use of rail motor cars in the non-rush hours in the suburban zone, which is a rather novel use of this equipment—inasmuch as in the non-rush hours there is any quantity of available steam equipment standing around idle. Indeed one of the disadvantages of operating suburban service is the concentration of traffic into peak periods and the very low daily mileage which can be got out of the rolling stock. In spite of this handicap, however, the company feels that there is a field for experiment with the rail motor car in the suburban zone—indeed perhaps one of the largest fields for it—by reason of

B.& M.T.-11 BOSTON AND MAINE TRANSPORTATION COMPANY

BUS OPERATOR'S DAILY REPORT

Operator's Name Date

			TIME WORKED From	To	Speedometer Readings	
Transfers Ended		Tickets Ended	M	M	Ended	
Transfers Started		Tickets Started	M	M	Started	
Transfers Issued		Tickets Issued	M	M	Total	
Transfers Ended		Tickets Ended	M	M	Ended	
Transfers Started		Tickets Started	M	M	Started	
Transfers Issued		Tickets Issued	M	M	Total	
Transfers Ended		Tickets Ended	M	M	Ended	
Transfers Started		Tickets Started	M	M	Started	
Transfers Issued		Tickets Issued	M	M	Total	

Trip No.	Bus No.	Reg. No.	Specify Terminals and Time: Starting From	Time	Arriving at	Time	Fare Box Readings: Com. No.	Closing No.	Collections Each Trip: Cash	Transfers	Tickets	
1												
2												

Fig. 2—Bus Operator's Day Card

the greatly reduced cost of operation and the consequent ability to give more frequent service, holding for the railroad the mid-day passengers who pay full fare and who might otherwise use other means of transportation.

The Boston & Maine Transportation Company had in service last season 29 buses and 24 more are now being delivered. These buses vary considerably in type according to the service. Six of them are assigned to urban service in Portsmouth, N. H., in substitution for street cars. For this service a city type bus is used, as well as in the service from Portsmouth to York Beach. For lines where buses are substituted for trains special bodies allowing for inside space for baggage are employed. The baggage compartments are equipped with so-called "taxi seats," which fold up against the wall when not in use and can be used by passengers in the event that no baggage is carried. In addition a number of parlor coaches are operated on the long distance routes.

Maintenance and repair work on buses is taken care of entirely in the company's own garage at Portsmouth, N. H. The company feels that without question it should take care of this maintenance work itself rather than entrust it to private garages.

Bus Operation by Railroad Officers

The officers of the Boston & Maine Transportation Company are all railroad men. H. F. Fritch, president, is assistant to the chairman of the board of directors of the railroad; R. J. Littlefield, superintendent of motor coaches, was formerly an assistant superintendent of the railroad; R. E. Dowdell, superintendent Portsmouth district, was formerly with the railroad's street railway line in Portsmouth. The only officer holding an important supervisory position in the organization who has had no railroad experience is the foreman of the repair shop at Portsmouth, who is an automotive expert.

A number of applications for bus permits are still pending and some of these cover routes a considerable distance away from Portsmouth. It is not unlikely, therefore, that additional repair shop facilities will have to be arranged for in another locality further to the west.

Tickets and Accounting

Each bus operator is required to fill out each day a blank called a day card, an illustration of which is shown in Fig. 2. These cards are forwarded to the accounting department at Boston and all necessary records of operation are drawn from them by the railroad's accounting department, the principal totals being receipts and passengers carried. No attempt is made to compute passenger miles. The company's practice regarding tickets on buses varies on different lines. In some cases railroad tickets are accepted. Straight fares are computed, generally speaking, at the prevailing railroad rate of 3.6 cents a mile. In no case, however, are railroad commutation tickets accepted on the buses alone, but where commutation service is offered via bus a separate bus commuter's ticket is issued to be used with the railroad ticket.

As is generally known, New England winters are quite severe and the task of keeping roads open for bus operation in January, February and March presents considerable difficulties and entails a great deal of expense. However, during the past winter, the company managed to

CLAREMONT BRANCH.

LAKE SUNAPEE
CONCORD and NEWPORT
CLAREMONT

CONCORD and CONTOOCOOK

"ON THE RAILS" "OVER THE HIGHWAYS"

Bus Service operated by Boston & Maine Trans. Co.

TABLE 53 WEEK-DAYS. SUNDAYS.

Miles	Train Nos. STATIONS.	1 A.M. Train	8122 A.M. Train	3803 A.M. Train	9 A.M. Train	3807 A.M. Train	315 P.M. Train		8150 A.M. Train	3857 P.M. Train
0.0	BOSTON (No.Sta.) Lv	1.30	5.00	6.35	9.30	11.30	4.00	.....	.....	1.00
25.6	LOWELL...Mass.	2.22	6.15	7.28	10.11	12.11	4.41	.....	.....	1.49
39.0	NASHUA U. STA.	2.54	6.45	7.51	10.36	12.36	5.17	.....	.....	2.15
55.7	MANCHESTER	3.38	7.20	8.33	11.08	1.03	5.47	.....	.....	2.44
73.3	CONCORD...N.H. Ar	4.10	8.00	9.00	11.35	1.30	6.15	.....	.....	3.10
		Bus	Train	Train	Bus	Train	Bus		Train	Train
		A.M.	A.M.	A.M.	P.M.	P.M.	P.M.		A.M.	P.M.
0.0	CONCORD...N.H. Lv	6.50	8.05	9.10	12.15	1.45	6.30	.....	3.40	3.20
3.5	Garrison..... "	.....	8.13	.....	.....	.....	.....	.....	3.50	.....
6.5	Riverhill..... "	.....	/8.17	.....	.....	.....	.....	.....	/3.55	/3.33
7.9	Mast Yard..... "	.....	/8.27	.....	.....	.....	.....	.....	/3.59	.....
10.4	Tyler..... "	.....	/8.31	.....	.....	.....	.....	.....	/4.04	.....
.....	*Hopkinton (P.O.)* "	7.10	.....	.....	12.35	.....	6.50	.....	.....	.....
12.0	CONTOOCOOK "	.....	8.36	9.33	.....	2.07	.....	.....	4.08	3.45
.....	*Contoocook (P.O.)* "	7.20	.....	.....	12.50	.....	7.05	.....	.....	.....
.....	*Dorrville (P.O.)* "	.....	.....	.....	.....	.....	.....	.....	.....	.....
14.6	Dimond..... "	.....	.....	.....	.....	.....	.....	.....	.....	.....
16.5	Bagley..... "	.....	.....	.....	.....	.....	.....	.....	.....	.....
17.5	Lower Warner.. "	.....	.....	.....	.....	.....	.....	.....	.....	.....
18.8	Warner..... "	.....	.....	9.45	.....	2.20	.....	.....	.....	3.57
	Warner (P.O.) "									

A Page from the Current Public Time Table, Showing How Bus Runs and Trains Are Co-ordinated

keep all its operations going with the exception of one or two days when substitute services were operated on the rail lines.

Operating Rules

A carefully worked out, detailed code of operating rules has been prepared for the guidance of employees. They follow in the main the standard of the American Electric Railway Association.

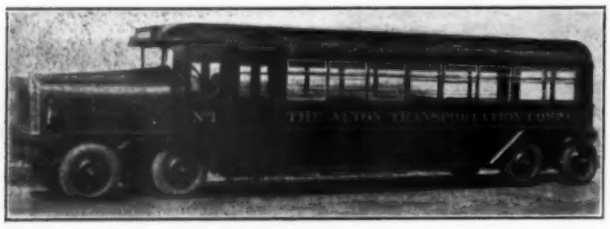
Uses Highways for Freight Service as Well

This in brief is the record of the comprehensive improvements which the Boston & Maine has undertaken in its passenger service. In freight service also, however, considerable improvement has taken place, also involving the use of highway motor vehicles. This phase of the company's activity will be dealt with in separate article to appear in a later issue.

Chicago & Alton Purchases 8-Wheel Highway Coaches

THE Chicago & Alton has just received and will soon place in service two eight-wheel highway coaches purchased from the Versare Corporation, Albany, N. Y. These coaches will be operated by the Alton Transportation Company, the bus-operating subsidiary of the railway, on the first of two bus routes (extending from Jacksonville, Ill., to St. Louis, Mo.), which the Alton is placing in service this year.

The eight-wheel, double truck design of the coaches is a new development in bus construction. These coaches are also said to represent the first gasoline-electric equipment for highway operation purchased by a



One of the 8-Wheeled Coaches

steam road. They were developed by the Versare Corporation and the Westinghouse Electric & Manufacturing Co.

Although the coach is 35 ft. 6 in. in over-all length, it can be completely turned around without backing in a street only 40 ft. wide. This is accomplished by means of a patented steering system which permits each wheel to run on a true circle, the wheels of the rear truck following almost identically in line with those of the forward truck. The eight wheels are used in the form of two complete and duplicate trucks which are in reality small chasses in themselves. The trucks turn about a king pin placed slightly in the rear of the front axle of each truck. The driver controls the front wheels of the forward truck by means of a steering wheel in much the same manner as any ordinary self-propelled vehicle. The steering column is connected through gears and levers to a quadrant to which the tie rods to the front wheels are fastened. The use of this quadrant causes the travel of the tie rods to be such as to keep the truck wheels tangent to their own circle of turning. The two front truck wheels are therefore parallel only when the coach is running on a straight road. The two front wheels of the front truck are turned in the desired direction by the driver and their pull causes the truck to turn in the proper direction. The action of the front truck, therefore, is very similar to the action of the ordinary four-wheeled vehicle.

The turning action of the rear truck is similar to this. Its two front wheels are controlled by an automatic steering device which permits articulated steering. Tie rods to the front wheels of the rear truck are attached to a quadrant mounted flatly in the rear of and at the center of the axle. Control for this quadrant is provided by a telescoping rod attached to a point on the frame about three feet in front of the axle. In operation the rod is turned by the body and actuates the quadrant to which the tie rods are attached.

The coach is equipped with a six-cylinder engine, the engine being connected to a 40-kw. Westinghouse generator. The generator is specially designed, and provided with a field winding arranged for supplying a small amount of separate excitation to assure a positive pick-up and stable operation under all load conditions. The type of generator is such as to make it possible to get a high engine speed in a minimum time under abnormal load conditions. The generator is connected with two Westinghouse traction motors which are mounted on the trucks.

The seating capacity of the coaches is 33 passengers. Of these, 24 are provided for by standard leather-upholstered cross seats and the remainder by a rotunda seat extending along the sides and around the rear end. Standing space for 37 passengers is provided. Lighting is furnished by open shade fixtures and ventilation is obtained by 12 standard railway type ventilators.

Santa Fe Operates Bus Tours

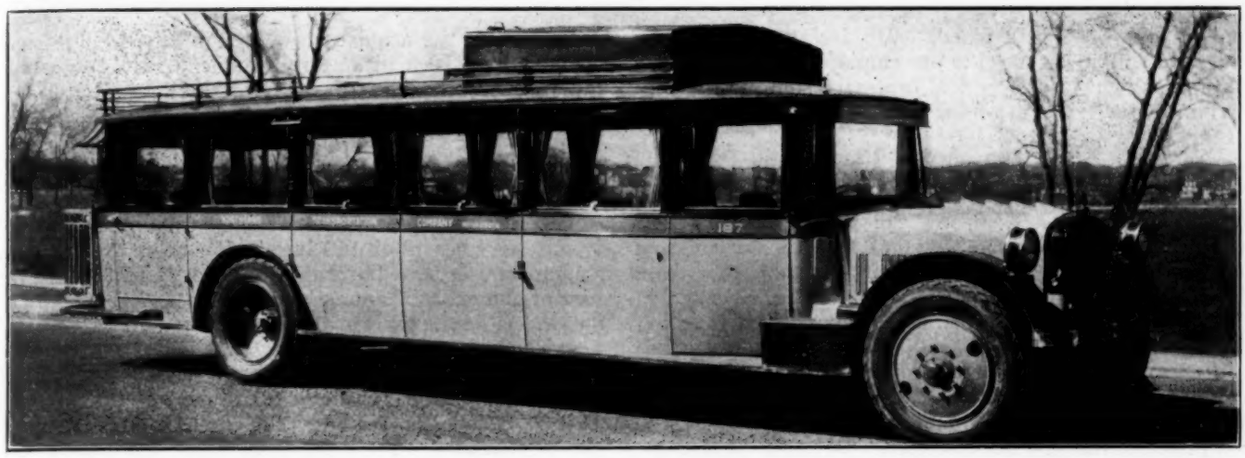
ON May 16 the Atchison, Topeka & Santa Fe, by arrangement with Fred Harvey, began the operation of special motor bus tours over the "Indian detour" in New Mexico. The tours are being operated especially for the benefit of trans-continental passengers, breaking the long railroad journey to and from the Pacific coast. Tourists who take the three-day bus trip, the $45 extra charge for which is made on an all-expense basis, will be carried in specially designed motor buses to the ancient Indian Pueblos and prehistoric cliff dwellings in the New Mexico Rockies between Las Vegas, N. M., and Albuquerque. The buses meet the westbound California Limited and the Navajo at Las Vegas and the same trains eastbound at Albuquerque, rejoining the trains after the 240-mile land cruise.

In addition to the longer bus trip, a shorter detour is provided for passengers whose time is limited. This shorter motor bus tour covers the sightseeing points near Santa Fe, the route extending over the 70 miles of highway between Albuquerque and Santa Fe.

The bus tour service is operated by Fred Harvey, who operates the dining car and hotel service of the Santa Fe, the buses used being owned by the Santa Fe Transporta-

Swivel Parlor Type Chairs Are a Feature of the "Harveycars"

tion Company, a Fred Harvey subsidiary. Seventeen buses have recently been purchased from the White Company to be used in the special tour service. Two of these are large buses of the standard parlor type which will be operated over the short tour between Albuquerque and Santa Fe. The other 15 are of the small bus type recently developed by the White Company. The small bus chassis, known as White Model 53, is designed to accommodate from 14 to 16 passengers. The bodies and interior equipment on the Santa Fe buses have been specially designed to provide the maximum of comfort and range of vision. On account of their unusual design, the buses are called "Harveycars." These buses are equipped with swivel parlor type chairs for passengers and have a large baggage compartment. In addition to the 17 buses just purchased, the Santa Fe Transportation Company owns two White buses which have been in service for 11 years and which will be used this year on the Albuquerque-Santa Fe tour.



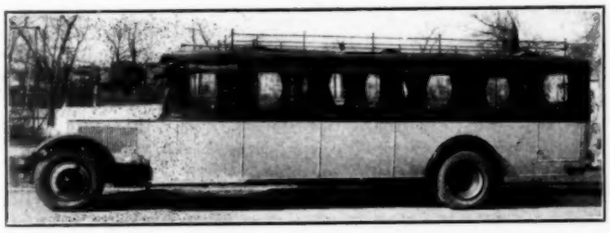
One of the Fleet of 140 Northland Buses

Great Northern Largest Railway Bus Operator

Approximately 3,000 miles of bus lines covered by 140 motor buses—Service being co-ordinated with that of railway

THROUGH the Northland Transportation Company, a subsidiary, the Great Northern is operating 140 motor buses on approximately 3,000 miles of highway generally paralleling Great Northern railway lines. This bus line mileage compares with the Great Northern railway mileage in Minnesota of approximately 2,100 miles.

The Northland Transportation Company is at the present time the largest railway-owned bus line in the United States. Its buses operate in such a way as to co-ordinate with the train service of the Great Northern and to supplement it.



The Ventilating Eaves Are an Interesting Feature of This bus

The Great Northern's first steps toward the operation of motor buses to supplement its train service were taken in May, 1925. At that time two subsidiary companies, the Great Northern Transit Company and the Minnesota Transportation Company, were incorporated "to transport and carry passengers and freight for hire between points in the state of Minnesota and between points in the United States by means of motor vehicles." While the first two applications to the Minnesota Railroad and Warehouse Commission for certificates to operate buses were pending, it was decided to abandon the plans to start new bus lines and instead to enter the bus operating field by purchasing independent bus lines already in operation. To this end three of the principal bus companies in Minnesota, the original Northland Transportation Company, the Interstate Transportation Company and the Boulevard Transportation Company, were purchased and consolidated into the new Northland Transportation Company.

Reasons for Bus Operation

The Great Northern's reasons for undertaking bus operation have been summed up by President Ralph Budd in the following words: "For a given expenditure, we feel that we can furnish more and better transportation to the public (through operating buses ourselves) than if the same expenditure were made partly by the railway company on its right-of-way and partly by independent bus companies on parallel highways." This is amplified by memoranda issued at the time the Great Northern's plans were first made known. To quote one of these: "We propose to operate bus routes supplementary to our train service and so correlate it as to best accommodate public travel. This will stabilize the employment in railway service which during the past few years has suffered greatly by the loss of railway passenger business. Train and engine men who are possessed of seniority right of long standing and had every reason to feel secure in their employment, have been thrown out of their places on account of the commercial vehicles operating on the public highways.

"In addition to improving the service, public economy will be effected by removing unnecessary duplication and consequent unnecessary destruction of the very costly public highways. There is a great public interest in this matter because the railways are essential carriers and cannot be eliminated and since they must be supported by the traffic they are permitted to enjoy, the public's bill for transportation will be less if all possible waste in the furnishing of transportation, as well as in the use of

public highways, is avoided. We feel that the action intended will be beneficial to our employees and the public, as well as being a proper and necessary step for the protection of the earnings of the company."

Extent of Bus Lines

The accompanying map of the bus lines of the Northland Transportation Company indicates graphically their extent. While the greater part of the bus line mileage is within the state of Minnesota, it is notable that there is a considerable mileage in northern Wisconsin and that four of the bus lines cross other boundaries, one touching Port Arthur, Ont., on Lake Superior, two others extending into North Dakota at Fargo and another penetrating South Dakota and extending to Sioux Falls.

Great Northern railway lines are paralleled by a majority of the bus lines. Thus the Great Northern's service is supplemented by the bus lines from the Twin Cities to Duluth, from the Twin Cities to Mora, from Duluth to Virginia, Hibbing and Grand Rapids, from the Twin Cities to Fargo, Wadena, and Bemidji, and intermediate points, from the Twin Cities to Willmar, and from the Twin Cities to Marshall, Pipestone and Sioux Falls.

In addition to these bus lines which parallel its rail lines, the Great Northern has several routes penetrating into territory foreign to its rail lines—for example, the lines from Duluth to Brainerd, from the Twin Cities to Worthington, from the Twin Cities to Fairmont, from Duluth to Ashland, from Duluth to Port Arthur, and from Duluth to Eau Claire, Wis. These lines which parallel other railroad lines were obtained by the Great Northern when it made its original purchases of the three large independent bus companies. As proof of its lack of desire to thus compete with its neighbors, the Great Northern offered to sell these particular lines to the railways whose territory they invaded. These offers, however, were declined.

Summarizing, it may be said that the bus lines of the Northland Transportation Company cover the state of Minnesota with virtually the same completeness as do the railway lines of the Great Northern, the Great Northern owning one-third of the railway mileage in Minnesota. The central and southwestern parts of the state are particularly well covered by the Northland bus lines.

Frequency of Bus Service

The same frequency of service found in bus operations generally is offered by the Northland company. Thus, on some of its shorter lines an hourly service is provided from early in the morning until late at night. On routes of greater length on which there is less demand for such frequent service, the schedules are arranged to provide two or three round trips in the morning and a similar service in the afternoon. On its longest lines, such as those from the Twin Cities to Fargo, and from the Twin Cities to Duluth, the frequency of service varies from two to four round trips daily.

The question of the number of schedules to operate over a particular line daily has been a matter of experiment. On some lines, the density of population and the amount of travel encountered render an hourly service necessary and not so frequent as to result in the running of the buses with a few or no passengers. On other lines where there is less demand for frequent service, tests have been made to determine the happy medium between the very frequent service which has a tendency to develop travel and the infrequent service which costs less but does not stimulate the acquisition of new business. Frequent changes have been made on a number of the routes and the present schedules of the Northland are those that experience has shown to give the best service to the public while keeping operating costs at a reasonable level.

Equipment

The present passenger-carrying equipment of the Northland consists of 140 buses of various types. New equipment has been purchased on a large scale since the first of the year, 33 buses having been added recently to the fleet. On the basis of the 25 per cent annual depreciation which the Northland figures on, some 35 or 40 new buses will have to be purchased each year to replace obsolete equipment on the basis of the present scope of

Great Northern Railway and Bus Lines

operations. The expansion of operations will of course necessarily increase this number.

All of the new buses purchased by the Northland are of the parlor type, having individual well-cushioned chairs, luxurious fittings and baggage compartments. Of the buses bought since January 1 of this year, 7 have been Fageols, 7 Yellows, 4 Internationals, 3 Whites, 3 Macks and 9 Wilcox. The Northland has specified some of the equipment that has gone on these buses—for example, nearly all of the bodies fitted to the chasses have been manufactured by Ecklund Brothers of Minneapolis—but the chasses themselves have usually been the standard products of the manufacturers. Such parts of the buses as tires, seats and accessories, however, have been specified by the Northland.

The nine buses ordered from Wilcox Trucks, Inc., Minneapolis, are being built in their entirety to specifications of the Northland. These buses are powered with a six-cylinder engine and are equipped with a large size transmission, cartridge core radiator, "one shot" lubrication system, balloon tires, balloon type stearing gear, air cleaner, oil filter and duplex lubrication. The body, which was manufactured by the Wilcox company, has a ventilating windshield, ventilating eaves, and individual chairs upholstered in leather and mohair. The body is

all metal and has a lacquer finish. The baggage compartment is a permanent compartment of solid construction, mounted on the roof of the bus.

Operating Organization

The officers of the Northland Transportation Company are: C. E. Wickman, president and general manager, who was formerly president of the original Northland Transportation Company; C. O. Jenks, vice-president, who is also vice-president of the Great Northern; W. P. Kenney, vice-president, also vice-president of the Great Northern; F. L. Paetzold, secretary and treasurer, also secretary and treasurer of the Great Northern; G. H. Hess, Jr., comptroller, also comptroller of the Great Northern. Ralph Budd, president of the Great Northern, is a director of the Northland. In the operating organization, O. F. Caesar is assistant general manager in charge of outside operations. W. J. Kay is assistant general manager in charge of the general office of the company and having under his jurisdiction purchases, traffic and accounting departments. Harold Larson is master mechanic in charge of the maintenance of equipment. The organization includes also two managers of outside terminals, one at Duluth and the other at Hibbing. The Northland employs 150 bus drivers, each of whom will soon have a bus assigned to his exclusive use. A stock of spare parts valued at from $30,000 to $40,000, is maintained constantly, these stores being in charge of storekeepers located at Hibbing, Duluth and Minneapolis.

The Northland buses are housed and maintained at garages located at Minneapolis, Duluth and Hibbing. At Minneapolis a new garage having dimensions of 160 by 220 ft., and accommodating 90 buses, has just been completed. This will replace the three garages which were previously used, these garages being those used by the three companies previous to their consolidation into the Northland company.

Division No. 1.

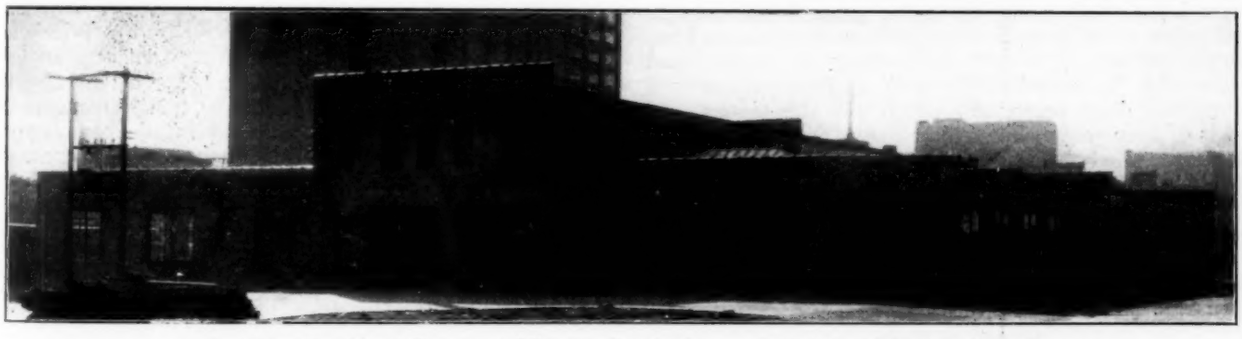
From	To	No. of drivers	Daily bus miles	No. of buses	Road miles	
	Two Harbors	...	....	...	Two Harbors	27
Duluth	Port Arthur	4	840	4	Grand Marais	110
					Port Arthur	202
Duluth	Virginia	...	....	...	Virginia	66
	Ely	8	1,884	8	Ely	116
	Hibbing	...	....	...	Hibbing	79
Duluth	Chisholm	4	1,004	4	Chisholm	82
Duluth	Proctor	6	400	3		8
Duluth	Cloquet	2	358	1		22
Cloquet	Carlton	1	144	1		6
	Brainerd	...	....	...	Brainerd	130
Duluth	Fargo	3	572	2	Fargo	286
Duluth	Twin Cities No. 1	7	1,038	6		173
	Ashland	...	....	...	Ashland	75
Duluth	Bayfield	4	800	3	Bayfield	97
		39	7,040	32		

Division No. 2

From	To	No. of drivers	Daily bus miles	No. of buses	Road miles	
Minneapolis	Mora	2	414	2		69
	Onamia	...	....	...	Onamia	89
	Isle	5	1,288	5	Isle	103
Minneapolis	Hibbing	...	....	...	Hibbing	226
Minneapolis	St. Cloud	2	264	2		66
	Alexandria	...	....	...	Alexandria	140
Minneapolis	Long Prairie	3	540	2	Long Prairie	130
	Brainerd	...	....	...	Brainerd	130
	Crosby	10	2,125	8	Crosby	148
	Aitkin	...	....	...	Aitkin	163
Minneapolis	Bemidji	...	....	...	Bemidji	245
	Sauk Center	2	388	2	Sauk Center	110
Minneapolis	Fergus Falls	...	....	...	Fergus Falls	194
Minneapolis	Fargo	3	526	2		263
Minneapolis	Wadena	2	346	2		173
	Wadena	...	....	...	Wadena	173
Minneapolis	Bemidji	3	536	2	Bemidji	268
	Fargo	...	....	...	Fargo	197
St. Cloud	Fergus Falls	3	532	3	Fergus Falls	128
		35	6,959	30		

Division No. 3

From	To	No. of drivers	Daily bus miles	No. of buses	Road miles	
	Marshall	...	....	...	Marshall	164
Minneapolis	Tracy	7	1,316	6	Tracy	165
	Mankato	...	....	...	Mankato	84
Minneapolis	Fairmont	7	1,440	7	Fairmont	150
	Willmar	...	....	...	Willmar	98
Minneapolis	Madison	7	1,264	7	Madison	169
	Mound	...	....	...	Mound	23
	Long Lake	...	....	...	Long Lake	16
Minneapolis	Maple Plaine	8	1,012	6	Maple Plaine	20
St. Paul	Oxboro	1	224	1	Oxboro	14
Minneapolis	Duluth No. 35	5	692	4	Duluth	173
	Taylors Falls	...	....	...	Taylors Falls	49
St. Paul	Grantsburg	5	600	3	Grantsburg	101
		40	6,548	34		



The New Northland Garage at Minneapolis, the Largest of Three That Are Owned

Buses whose operations center around Duluth are housed and maintained at a garage located there, this one having a capacity of 45 buses. In addition to these, arrangements have been made for space in garages located at 10 points outside the principal terminals where buses may remain over night when their schedules do not permit their return to the main terminals. At Hibbing the Northland owns a body and paint shop which also does general overhauling. Several bodies have been built in the company's own shops at Hibbing.

Operating Plan

For operating purposes the Northland bus line system is divided into three divisions. The lines making up these divisions, the number of drivers assigned to them, the daily bus miles operated, the number of buses used, and the road miles covered, are shown in the accompanying table.

In addition to these regular daily schedules, the Northland does a large business during the summer months in handling special parties. Extra buses are also run on the regular schedules on Saturdays and Sundays during the summer when the pleasure riding business is particularly heavy. At Minneapolis and St. Paul the Northland buses use the union bus terminals. Outside the Twin Cities the Northland uses stations owned by itself. Thus it owns a large bus station at Duluth, and others at St. Cloud,

Fergus Falls and Mankato. All of these have waiting rooms for passengers and are managed by agents working exclusively for the Northland. At other towns arrangements are made with leading hotels for the provision of waiting rooms for passengers, and tickets are sold by employees in these establishment who receive a commission of 5 per cent on their gross ticket sales. Such agencies as these are found in virtually every town along the Northland's lines. In no instance are stations of the Great Northern used by the Northland's buses. On the contrary, there is no physical connection whatever between the two.

In addition to stops at Northland stations, buses stop also on signal along the highways. All of the buses operate on such local schedules, there being no limited non-stop schedules.

Although there is no minimum or maximum number of hours of work for drivers of the buses, they are assigned to their runs in such a way as to keep the average runs per day per man at approximately 200 miles. This is considered the maximum mileage over which a bus driver can operate in a day at his best efficiency and the minimum which can be required of a driver in order to secure a full return for the wages paid him.

To develop new business advertising of the Northland's bus lines is carried in local newspapers and in the folders which are broadcast. No paid traffic solicitors are employed. Rather, the attempt to build up traffic has been centered around the arrangement of the most convenient schedules and lines and the provision of new and modern equipment of the most comfortable type.

Winter Operations

Although the severity of the Minnesota winters has presented a problem to the Northland, steady progress is being made in combating this obstacle to efficient operation. The Highway Commission of Minnesota cooperates with the bus lines operating over the highways to keep the roads open during the winter. The Northland owns a motor truck fitted with snow plows and has several tractors also used in clearing the roads. Last winter the Northland operated a specially constructed four-wheel drive snow plow which was able to clear the roads of deep snow while maintaining a speed of 20 miles an hour. The best means to keep the roads clear of snow which has been found in Minnesota is the snow fence. Snow fences are being installed along many of the highways with a view to having all the principal roads thus protected in the near future. The Northland found last winter that roads protected by snow fences could be kept open readily.

Rates of Fare

The basic rates of fare charged by the Northland Transportation Company vary according to the type of pavement on the roads over which the buses operate. On paved roads the basic rate of fare is 2¾ cents per mile. On unpaved roads the basic rate of fare is 3 cents per mile, there being a few places in which a fare in excess of 3 cents per mile is charged. Commutation rates are offered between a few points, particularly from the Twin Cities to the nearby lake resorts. The rates charged for provision of buses to special parties vary in accordance with the capacity of the buses furnished. The rate for a bus with a capacity of from 18 to 20 passengers is 40 cents per mile; for a bus with a capacity of 20 to 25 passengers, 45 cents per mile; and for buses with passenger capacities of 26 and over, 50 cents per mile. These special party rates have just been put into effect through an agreement reached by the Minnesota bus lines association.

The Great Northern's bus operations are still well within the experimental stage. The results which have been obtained in the past cannot be considered a true criterion of what can be accomplished in the future. Changes are constantly being made to increase the efficiency of operation and to build up new business while lowering operating costs.

The rate of fare charged, 2.75 to 3 cents per mile, may have been a factor in making operations of the past year unprofitable. It is generally considered by authorities on the subject that the rate of fare for bus transportation should be greater than that for rail transportation. For this reason a rate of fare of approximately four cents a mile has been considered about the right rate level under ordinary circumstances. Its decision on fare rates has been based by the Northland on tests made as to the sources of the traffic carried by their buses, which have shown conclusively that they are drawing their business from the private motor car rather than from railway trains. To make riding on a motor bus more attractive than riding in a private automobile, the Northland has felt that its strongest argument has been economy. It has considered that the cost of operating a private automobile is nine cents or more per mile and that to make bus transportation attractive it must keep its rates low enough so that the charge for three passengers, which is considered the average load in a private automobile, must be less than the cost of operating the private car. For this reason the Northland has considered that rates between 2.6 cents per mile and 3 cents per mile is the maximum that can be charged if patronage is to be attracted from the private automobile. The rate question is still however, a subject under serious consideration.

Co-ordination of Rail and Bus Lines

Up to the present time the operations of the Northland have been completely divorced from Great Northern operations. While schedules of the buses have been arranged in a number of instances to fill the waiting interval between trains there is no physical connection between buses and trains. With one exception, train service on the Great Northern has not been reduced on account of its bus operations. None of the facilities of the Great Northern offices are used by the Northland company. The Northland has its own organization completely separate from that of the Great Northern. As a matter of fact, there has been no official announcement whatever that the Northland Transportation Company is owned by the Great Northern. The co-ordination of rail and bus service of the Great Northern is, therefore, a matter to be undertaken and carried out entirely in the future.

One step toward co-ordination has, however, been taken, this occurring within the past two weeks. Authority was received from the Railroad and Warehouse Commission of Minnesota to take off one train between Minneapolis and the Lake Minnetonka district because of the frequent service offered by the Northland buses. Commutation tickets for the transportation of passengers between these points were made interchangeable, good either on the trains of the Great Northern or on the buses of the Northland. The interchange privilege applies, however, to only two classes of commutation books, one containing tickets for 10 rides and the other for 25 rides. Monthly books of tickets for 50 rides are not interchangeable and these tickets are not accepted on Northland buses because the price of such tickets is substantially less than the price of the 10 and 25 ride tickets, the rate being too low to permit the Northland to carry passengers at a profit.

The Great Northern is feeling its way into its new bus operating departure and is depending upon experience rather than theory to point out the right way to efficient and complete co-ordinated transportation.

General News Department

The Interstate Commerce Commission has postponed until November 1 the effective date of its second train control order, as it affects the Baltimore & Ohio.

The American Association of General Baggage Agents will hold its regular meeting at Atlantic City, N. J., on Tuesday, June 1; headquarters at the Ritz-Carlton.

The Interstate Commerce Commission has postponed until December 31 the effective date of its second automatic train control order as it affects the Atlantic Coast Line.

The chief executives of the "standard" railroad labor organizations met in Washington on May 17 for the purpose of considering procedure under the new railroad labor bill as passed by Congress.

The principal speaker at the dinner of the American Railway Guild on the evening of May 19 was Sir Josiah Stamp, G.B.E., president of the London, Midland & Scottish Railway.

The House Committee on interstate and foreign commerce has announced that it will begin hearings on May 24 on the new consolidation bill introduced by Chairman Parker of the committee, which was abstracted in the *Railway Age* of May 8.

The Protective Section of the American Railway Association, W. W. Morrison, chairman, is to hold its annual meeting at Mount Royal Hotel, Montreal, P. Q., on Monday and Tuesday, June 28 and 29, not June 23 and 24 as heretofore announced.

The suit of Daniel C. Wenner against the Western Maryland for $7,200 wages covering the time since he was dismissed from the service of the company in March, 1923, when the road let its car repair work to a contractor, has been decided against him, in the circuit court of Baltimore County, Maryland. The main allegation of the plaintiff was that the railroad company, following negotiations with representatives of the shopmen, had agreed that employees should not be discharged except after a fair hearing; but the decision of the court, by chief Judge Offutt, holds that the code of rules cited does not constitute a contract between the employer and the employee. This suit, which is a test case, designed to settle the status of claims aggregating more than $1,000,000, will no doubt be appealed to the higher court.

United States Chamber of Commerce

Resolutions opposing the idea of regional representation on the Interstate Commerce Commission, as embodied in a bill now on the Senate calendar, were adopted by the Chamber of Commerce of the United States at its annual convention at Washington on May 13. The resolutions were proposed by the Chicago Association of Commerce.

Paul Shoup, executive vice-president of the Southern Pacific, was elected vice-president of the chamber, for the Western district, and Carl R. Gray, president of the Union Pacific, was elected a director.

N. Y. C. Train Control Case

The New York Central has been given a clean bill of health by the Interstate Commerce Commission on the complaint filed by the Sprague Safety Control & Signal Corporation, which the commission has dismissed as having no basis under the provision of its train control orders or other provisions of the law cited. The report by Division I on Thursday holds that section 3 of the interstate commerce act does not apply to the making of contracts for the purchase of equipment; that the matter of train control devices is controlled by section 26 and not by the car service provisions of section 1; that the complaint that specifications are being violated by failure to include speed control and in the employment of a forestalling device in the General Railway Signal Company device being installed have no basis. Objections to general device made by Sprague were found not to have been demonstrated on the record and provisions of the Clayton law were found not to have been violated.

For the Best Essay on Courtesy

The Southern Pacific has inaugurated a prize essay contest among employees and will distribute $250 for the best essays on courtesy. Presidents of western universities and colleges will act as judges in the contest. The contest started May 1 and will last until June 15. The prizes are as follows: Three system grand prizes of $50, $25 and $10; fifteen division and general office first prizes of $5; five $2 prizes each for the Los Angeles and Sacramento divisions; four $2 prizes each for the Portland, Western Coast and Salt Lake divisions; three $2 prizes each for the Tucson and Rio Grande divisions and the general offices; two $2 prizes each for the Shasta, San Joaquin, Stockton and New Mexico divisions; and one $2 prize for each of the steamer and East Bay electric divisions.

New York Electrification Law Relaxed

The governor of New York on May 18, approved the law, passed by the recent legislature, authorizing the Public Service Commission, after public hearing, to extend the time within which railroads must cease the operation of steam locomotives in New York City. This law becomes a part of Section 53a of the Public Service Commission law, and allows an extension of not more than five years from January 1, 1926. In compliance with the law the use of electric or oil burning locomotives has already been introduced in New York City to a considerable extent, but the New York Central, especially on its heavy freight line from Spuyten Duyvil, southward to Sixtieth street, has not been able to complete electrification, the elimination of numerous grade crossings being involved in the problem and some time since secured a temporary injunction in the Federal Court forbidding enforcement of the penalties prescribed by the statute, which otherwise could have been imposed on January 1.

Railroad Men Visit A.R.A. Air Brake Laboratory at Purdue

About 150 men, representing as many Class I railroads, gathered at Purdue University on Wednesday, May 12, to inspect for the first time the air brake testing laboratory and work now being performed at Purdue University in co-operation with the American Railway Association. For the benefit of the visitors, a series of five demonstrations was staged, under three different conditions, making fifteen tests in all. H. A. Johnson, director of research at Purdue, explained that no results were available at that time and that none would be summarized for many months, nor would detail information as to how any particular set of equipment functioned be available until the whole work is completed.

Dean A. A. Potter and Prof. G. A. Young, head of the school of mechanical engineering, addressed the guests at luncheon. Dean Potter outlined briefly a history of Purdue and sketched the engineering experiment station work being performed at the institution.

Tests Show Strength of Welded Roof Trusses

Tests to determine the effectiveness of welded joints in steel roof trusses were carried out at Buffalo, N. Y., during the last week by the Linde Air Products Company, New York. Four gable roof Fink trusses of 40-ft. span and 10-ft. rise, designed for a load of 3,000 lb. at each of seven panel points were tested to failure. One was a riveted truss built according to the design of

(*Continued on page* 1408)

Freight Operating Statistics of Large Steam Roads—Selected Items for March, 1926,

Region, road and year	Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross, Excluding locomotive and tender	Ton-miles (thousands): Net, Revenue and non-revenue	Average number of locomotives on line daily: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:												
Boston & Albany	1926	404	266,647	292,711	35,957	5,529	67.5	290,118	113,624	129	17	11.3	3
	1925	404	241,784	257,761	25,854	5,035	68.8	252,065	93,556	128	14	9.8	16
Boston & Maine	1926	2,250	555,113	648,154	61,451	14,362	70.1	735,492	296,034	337	88	20.6	34
	1925	2,282	526,121	598,324	55,110	12,994	71.1	640,336	253,759	337	115	25.5	27
N. Y., New H. & Hartf	1926	1,892	526,590	554,005	40,435	14,938	69.3	774,169	316,240	282	54	16.1	18
	1925	1,931	485,509	505,487	32,810	13,243	70.9	646,235	257,915	293	67	18.6	15
Great Lakes Region:												
Delaware & Hudson	1926	875	431,212	594,826	61,447	12,079	65.3	763,351	382,437	242	39	14.0	45
	1925	875	369,888	501,893	48,929	9,825	61.9	628,100	298,821	243	35	12.6	67
Del., Lack. & Western	1926	993	603,879	721,690	98,260	18,941	70.9	1,045,593	468,178	277	61	18.1	11
	1925	993	578,726	678,195	92,749	18,352	70.0	1,022,963	458,764	298	63	17.4	21
Erie (inc. Chic. & Erie)	1926	2,323	1,050,249	1,159,647	114,483	37,557	65.8	2,282,513	1,026,256	578	112	16.2	92
	1925	2,325	941,035	1,055,477	89,496	34,974	67.7	2,046,820	938,628	646	94	12.7	178
Lehigh Valley	1926	1,345	641,533	710,176	79,620	19,752	65.5	1,148,144	512,544	402	90	18.3	85
	1925	1,357	604,160	665,807	76,294	18,744	64.7	1,112,773	499,369	453	67	12.8	104
Michigan Central	1926	1,835	636,732	657,039	24,666	22,422	64.4	1,178,895	412,744	276	52	15.9	82
	1925	1,826	574,487	590,859	20,738	19,791	63.5	1,042,894	370,446	303	66	17.8	94
New York Central	1926	6,482	2,317,478	2,626,989	182,829	82,155	62.5	4,969,683	2,146,146	1,123	343	23.4	138
	1925	6,478	2,063,238	2,319,815	151,965	75,077	62.4	4,441,568	1,858,265	1,211	366	23.2	304
New York, Chic. & St. L.	1926	1,665	685,120	694,924	7,141	21,753	67.6	1,169,520	465,374	243	61	20.0	53
	1925	1,669	663,598	671,975	7,638	20,684	66.7	1,117,283	442,990	264	60	18.4	61
Pere Marquette	1926	2,179	452,499	463,964	6,117	11,693	64.8	660,294	274,253	186	30	13.8	22
	1925	2,198	367,190	375,597	6,143	9,705	65.6	551,470	261,963	190	25	11.8	35
Pitts. & Lake Erie	1926	231	140,340	144,381	1,711	4,610	60.8	351,578	192,793	63	16	20.6	15
	1925	231	131,865	134,247	1,332	4,538	62.0	340,619	194,634	66	22	24.6	12
Wabash	1926	2,497	750,590	781,201	12,246	23,315	67.6	1,262,875	493,788	301	66	18.0	54
	1925	2,497	696,540	730,196	10,862	21,364	68.1	1,155,495	461,152	323	53	14.1	42
Central Eastern Region:												
Baltimore & Ohio	1926	5,197	1,965,033	2,292,851	169,685	55,836	62.7	3,551,242	1,671,730	983	204	17.2	142
	1925	5,196	1,846,772	2,150,268	161,685	53,432	65.0	3,313,665	1,581,943	903	336	27.0	69
Central of New Jersey	1926	691	305,199	334,314	41,058	7,807	58.2	525,739	251,464	240	30	11.1	46
	1925	692	286,171	315,722	37,809	7,017	60.2	467,032	223,758	227	43	15.9	23
Chicago & Eastern Ill.	1926	945	280,436	283,897	4,053	7,518	63.7	458,910	214,842	120	38	24.0	31
	1925	945	240,879	242,625	4,349	6,601	64.3	395,686	188,508	122	37	23.2	41
Clev., Cin., Chic. & St. L.	1926	2,374	763,547	796,550	20,956	23,309	60.5	1,512,042	686,451	328	106	24.5	13
	1925	2,376	693,567	734,106	12,128	21,477	63.7	1,341,618	624,358	367	72	16.5	68
Elgin, Joliet & Eastern[1]	1926	460	146,206	155,933	8,240	4,293	62.9	325,364	166,537	80	12	12.9	...
	1925	460	139,305	152,452	8,082	4,167	64.0	318,464	169,786	77	15	16.3	...
Long Island	1926	393	55,214	62,068	15,931	715	57.8	45,561	18,202	46	9	16.5	...
	1925	393	47,703	53,152	12,479	664	57.5	40,732	15,369	37	17	31.2	...
Pennsylvania System	1926	10,882	5,133,444	5,612,047	440,518	140,052	62.5	9,199,910	4,230,548	2,659	612	18.7	168
	1925	10,930	4,523,895	4,894,665	375,506	127,946	64.5	8,252,639	3,847,969	2,515	921	26.8	94
Reading	1926	1,131	713,857	782,251	72,847	18,451	60.5	1,273,356	645,461	362	76	17.3	45
	1925	1,132	637,792	701,502	69,805	16,258	62.0	1,088,173	548,674	398	77	16.2	83
Pocahontas Region:												
Chesapeake & Ohio	1926	2,637	1,190,917	1,280,553	44,320	35,438	55.0	2,859,589	1,520,110	547	92	14.4	50
	1925	2,597	1,062,239	1,122,526	30,484	30,911	56.6	2,403,021	1,275,666	486	109	18.3	42
Norfolk & Western	1926	2,231	894,814	1,103,730	38,376	29,445	59.7	2,378,059	1,265,892	569	59	9.4	129
	1925	2,230	797,009	960,775	34,708	24,910	61.3	1,905,114	999,706	558	88	13.7	141
Southern Region:												
Atlantic Coast Line	1926	4,924	1,053,673	1,068,323	18,506	25,966	59.6	1,510,540	581,138	415	49	10.5	19
	1925	4,879	948,550	966,531	15,770	24,721	61.6	1,303,575	503,769	375	45	10.7	18
Central of Georgia	1926	1,907	390,119	392,092	6,944	8,822	67.9	499,171	221,901	157	21	11.6	20
	1925	1,907	362,247	363,371	5,765	8,222	72.9	434,002	195,910	153	13	7.7	31
I. C. (inc. Y. & M. V.)	1926	6,225	1,849,834	1,865,611	41,985	51,064	65.0	3,144,193	1,361,807	742	116	13.5	15
	1925	6,225	1,693,840	1,711,662	35,992	49,478	64.7	3,015,322	1,273,726	779	110	12.4	74
Louisville & Nashville	1926	5,021	1,873,000	1,976,458	70,113	35,375	60.5	2,378,711	1,139,349	597	116	16.2	7
	1925	5,027	1,667,435	1,779,125	68,821	31,892	63.5	2,041,332	978,821	588	112	16.0	35
Seaboard Air Line	1926	3,905	692,923	706,198	15,930	17,011	64.5	969,077	395,220	314	28	8.1	...
	1925	3,755	637,324	651,526	14,611	15,338	66.6	841,517	338,037	228	42	15.5	...
Southern System	1926	8,043	2,304,221	2,354,979	42,654	54,539	65.3	3,077,667	1,273,935	1,033	152	12.8	28
	1925	8,157	2,054,313	2,117,372	40,959	50,390	68.3	2,739,555	1,130,972	1,073	153	12.5	63
Northwestern Region:												
Chic. & North Western	1926	8,457	1,467,352	1,505,892	25,728	34,346	62.9	1,922,583	769,355	747	191	20.4	110
	1925	8,463	1,365,084	1,397,720	23,035	31,821	65.3	1,751,633	717,876	779	217	21.8	152
Chic., Milw. & St. P.	1926	11,202	1,520,394	1,645,376	100,027	44,422	66.7	2,454,979	1,048,839	886	214	19.5	214
	1925	11,202	1,508,985	1,590,750	75,092	42,187	66.8	2,342,719	1,026,504	967	171	15.0	114
Chic., St. P., Minn. & Om.	1926	1,819	317,688	340,804	13,586	6,165	67.5	326,903	132,461	164	37	18.5	4
	1925	1,819	304,491	320,247	12,535	6,045	69.8	325,008	135,098	154	45	22.6	2
Great Northern	1926	8,222	732,635	760,955	43,426	25,102	69.2	1,366,750	609,022	584	152	20.6	157
	1925	8,251	713,493	737,955	41,102	22,789	69.6	1,237,349	568,022	623	161	20.6	155
M., St. P. & S. Ste. M.	1926	4,372	529,897	542,165	3,935	12,508	69.4	639,169	276,427	290	50	14.7	25
	1925	4,375	507,136	518,643	5,739	12,441	70.3	635,180	283,575	298	44	12.8	31
Northern Pacific	1926	6,510	802,047	845,649	46,000	26,734	70.8	1,436,596	637,006	512	136	21.0	105
	1925	6,435	732,755	765,005	41,691	24,025	75.4	1,256,198	587,162	521	177	25.3	117
Oreg.-Wash. R. R. & Nav.	1926	2,185	181,957	191,464	14,880	5,668	76.9	296,360	132,740	138	19	12.2	14
	1925	2,181	176,603	185,828	15,154	5,098	75.1	273,320	125,000	138	22	13.8	20
Central Western Region:												
Atch., Top. & S. Fe (incl. P. & S. F.)	1926	10,143	1,495,056	1,590,436	78,841	45,843	65.3	2,643,204	990,253	804	156	16.3	255
	1925	10,045	1,446,417	1,529,710	76,830	44,089	65.4	2,491,950	942,612	828	165	16.6	267
Chicago & Alton	1926	1,022	307,783	326,147	5,307	7,214	60.2	447,021	180,274	138	21	13.4	29
	1925	1,022	280,329	306,962	4,297	7,147	63.6	420,406	174,511	131	23	14.7	32
Chic., Burl. & Quincy	1926	9,349	1,522,854	1,566,795	53,330	45,521	63.9	2,621,826	1,169,643	808	196	19.5	67
	1925	9,326	1,453,190	1,498,319	55,022	42,115	64.7	2,427,517	1,098,032	828	186	18.4	99
Chic., Rock I. & Pacific	1926	7,564	1,380,552	1,427,569	15,127	33,198	62.6	1,869,848	689,607	534	158	22.9	48
	1925	7,578	1,329,903	1,353,166	9,314	32,865	68.8	1,714,989	684,992	560	163	22.5	56
Denver & R. G. Wn.	1926	2,548	208,762	249,068	43,850	5,931	68.5	337,486	153,269	225	48	17.6	47
	1925	2,567	186,927	227,088	38,741	4,897	70.7	277,620	133,586	256	43	14.2	81
Oregon Short Line	1926	2,537	325,795	340,379	20,576	8,941	71.0	504,140	218,718	197	23	10.5	65
	1925	2,414	264,223	278,818	20,691	7,352	73.8	410,078	191,531	189	36	15.9	59
Southern Pac.—Pac. Lines	1926	8,556	1,484,250	1,625,285	249,030	44,987	63.8	2,701,017	1,018,014	729	207	22.1	80
	1925	8,517	1,357,158	1,496,363	240,992	42,215	68.4	2,437,638	1,024,125	696	242	25.8	87
Union Pacific	1926	3,691	910,377	935,997	42,032	35,535	74.5	1,822,322	735,981	475	64	11.9	191
	1925	3,688	734,239	751,156	36,176	28,733	78.3	1,421,987	602,685	481	72	13.1	214
Southwestern Region:												
Gulf, Colo. & S. Fe	1926	1,897	273,111	281,234	4,911	8,089	61.3	505,213	216,691	120	18	13.0	26
	1925	1,897	270,224	282,686	5,892	8,159	65.3	487,033	215,632	112	23	17.1	7
Mo.-Kans.-Tex.	1926	1,787	247,125	248,025	5,513	8,590	61.6	492,302	188,006	113	17	12.9	44
	1925	1,787	240,226	240,282	4,273	8,265	60.3	488,016	189,699	105	32	23.5	31
Mo.-Kans.-Tex. of Tex.	1926	1,389	172,934	176,791	2,898	4,591	61.7	264,776	102,428	124	21	14.4	61
	1925	1,389	196,889	206,336	6,231	5,295	60.9	318,704	128,325	123	30	19.7	48
Missouri Pacific	1926	7,288	1,389,031	1,421,986	42,710	39,658	64.4	2,292,293	949,079	530	90	14.5	3
	1925	7,278	1,350,660	1,395,242	38,460	36,694	65.9	2,106,450	912,689	517	104	16.8	1
St. Louis-San Francisco	1926	4,895	822,504	843,119	15,927	19,304	62.8	1,119,892	459,870	423	77	15.4	65
	1925	4,801	860,072	879,599	15,438	18,988	64.4	1,066,325	445,508	419	61	12.7	30
Southern Pacific Lines (in Tex. and La.)[2]	1926	4,435	660,352	661,266	1,981	14,873	67.3	821,240	337,715	253	74	22.6	34
	1925	4,441	699,128	702,362	5,634	15,966	65.4	926,883	393,652	263	66	20.0	24
Texas & Pacific	1926	1,953	304,198	304,215	1,415	8,318	64.4	473,087	174,168	156	27	14.9	11
	1925	1,953	305,642	305,642	1,945	7,661	63.6	440,846	165,587	149	43	22.2	19

[1]No passenger-train service. [2]Includes Franklin & Abbeville, Galveston, Harrisburg & San Antonio, Houston & Shreveport, Houston & Texas Central, Houston East & West Texas, Iberia & Vermilion, Lake Charles & Northern, Louisiana Western, Morgan's La. & Tex. R. R. & S. S. Co., and Texas & New Orleans.

Compared with March, 1925, for Roads with Annual Operating Revenues Above $25,000,000

Region, road and year	Average number of freight cars on line daily: Home	Foreign	Total	Per cent unserviceable	Gross ton-miles per train-hour, excluding locomotive and tender	Gross tons per train, excluding locomotive and tender	Net tons per train	Net tons per loaded car	Net ton-miles per car-day	Car miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles including locomotive and tender	Locomotive miles per locomotive day
New England Region:													
Boston & Albany.....1926	2,026	6,080	8,106	3.5	13,608	1,088	426	20.6	452	32.6	9,070	193	72.7
1925	2,765	5,931	8,696	2.8	13,302	1,043	387	18.6	347	27.1	7,468	193	64.3
Boston & Maine.....1926	11,983	17,894	29,877	7.6	13,686	1,325	533	20.6	319	22.1	4,243	157	53.9
1925	13,754	14,602	28,356	8.0	13,579	1,217	482	19.5	288	20.8	3,588	152	46.6
N. Y., New H. & Hartf...1926	15,979	23,765	39,744	13.9	16,275	1,470	601	21.2	257	17.5	5,392	139	57.2
1925	19,390	19,546	38,936	22.8	15,140	1,331	531	19.5	214	15.5	4,309	149	48.3
Great Lakes Region:													
Delaware & Hudson.....1926	8,690	7,727	16,417	5.2	19,935	1,770	887	31.7	751	36.3	14,096	175	75.4
1925	9,961	6,521	16,482	5.9	19,000	1,698	808	30.4	585	31.0	11,014	186	63.8
Del., Lack. & Western.....1926	14,857	9,140	23,997	4.6	20,339	1,731	775	24.7	629	35.9	15,216	182	78.2
1925	16,899	8,258	25,157	3.8	21,061	1,768	793	25.0	588	33.6	14,910	171	69.0
Erie (inc. Chic. & Erie)...1926	34,233	21,563	55,796	7.9	24,624	2,173	977	27.3	593	33.0	14,252	138	59.7
1925	37,155	20,475	57,630	7.3	24,902	2,175	997	26.8	525	28.9	13,020	134	50.0
Lehigh Valley 1926	19,986	12,473	32,459	7.4	22,861	1,790	799	25.9	509	29.9	12,289	165	51.8
1925	23,018	10,218	33,236	7.4	23,689	1,842	827	26.6	485	28.1	11,874	157	46.1
Michigan Central 1926	15,484	21,032	36,516	4.3	26,234	1,851	648	18.4	365	30.8	7,256	126	67.0
1925	14,144	16,185	30,329	5.7	25,388	1,815	645	18.7	394	33.2	6,545	127	53.6
New York Central.....1926	62,612	74,172	136,784	4.1	25,173	2,144	926	26.1	506	31.0	10,680	134	61.8
1925	73,134	67,425	140,559	4.1	25,637	2,153	901	24.8	426	27.6	9,254	129	50.6
New York, Chic. & St. L..1926	12,921	10,299	23,220	5.4	22,567	1,707	679	21.4	647	44.7	9,017	125	74.5
1925	11,336	10,505	21,841	6.7	22,142	1,684	668	21.4	654	45.8	8,564	126	67.7
Pere Marquette 1926	9,218	10,239	19,457	4.6	16,786	1,459	606	23.5	455	29.9	4,060	121	70.2
1925	9,917	8,280	18,197	6.7	16,085	1,502	713	27.0	464	26.2	3,844	119	57.3
Pitts. & Lake Erie.....1926	12,612	8,287	20,899	5.8	26,423	2,505	1,374	41.8	298	11.7	26,869	82	59.1
1925	15,435	8,552	23,987	4.3	26,886	2,583	1,476	42.9	262	9.8	27,126	76	50.1
Wabash 1926	13,427	11,991	25,418	2.5	24,040	1,683	658	21.2	627	43.7	6,379	149	69.7
1925	13,235	11,109	24,344	2.6	22,660	1,659	662	21.6	610	41.5	5,958	145	63.6
Central Eastern Region:													
Baltimore & Ohio.....1926	65,050	36,362	101,412	5.4	18,816	1,807	851	29.9	532	28.3	10,376	180	66.9
1925	70,706	32,803	103,509	9.6	18,884	1,794	857	29.6	493	25.6	9,821	176	60.0
Central of New Jersey....1926	15,371	15,127	30,498	3.5	16,023	1,723	824	32.2	266	14.2	11,741	176	44.8
1925	18,512	10,650	29,162	3.3	15,670	1,632	782	31.9	247	12.9	10,428	181	42.2
Chicago & Eastern Ill.....1926	13,808	4,621	18,429	18.1	21,783	1,636	766	28.6	376	20.7	7,333	155	58.9
1925	15,632	4,235	19,867	17.8	21,431	1,643	783	28.6	306	16.7	6,434	154	50.0
Clev., Cin., Chic. & St. L..1926	18,161	20,149	38,310	4.5	23,901	1,980	899	29.5	578	32.4	9,327	137	60.7
1925	17,423	19,676	37,099	4.0	24,592	1,934	900	29.1	543	29.3	8,475	130	54.8
Elgin, Joliet & Eastern[1]...1926	9,884	8,057	17,941	5.3	14,508	2,225	1,139	38.8	299	12.3	11,684	148	57.6
1925	10,034	8,170	18,204	8.4	15,636	2,286	1,219	40.7	301	11.5	11,912	148	56.3
Long Island 1926	1,933	8,320	10,253	0.8	4,632	825	330	25.5	57	3.9	1,493	321	46.0
1925	1,945	5,069	7,014	0.8	5,074	854	322	23.1	71	5.3	1,261	323	39.1
Pennsylvania System 1926	208,686	96,774	305,460	9.3	18,927	1,792	824	30.2	447	23.6	12,540	149	59.7
1925	216,873	85,481	302,354	10.2	19,312	1,824	851	30.1	411	21.2	11,357	141	49.5
Reading 1926	20,872	19,788	40,660	3.4	19,169	1,784	904	35.0	512	24.2	18,415	179	62.9
1925	24,686	15,188	39,874	2.4	19,114	1,706	860	33.7	444	21.3	15,641	176	52.4
Pocahontas Region:													
Chesapeake & Ohio.....1926	29,384	11,140	40,524	3.9	25,743	2,401	1,276	42.9	1,210	51.3	18,594	117	66.9
1925	33,699	9,099	42,798	3.6	24,210	2,262	1,201	41.3	962	41.2	15,845	118	62.5
Norfolk & Western.....1926	28,901	9,797	38,698	2.0	34,018	2,658	1,415	43.0	1,055	41.1	18,301	161	58.7
1925	32,492	8,552	41,044	4.3	29,389	2,390	1,254	40.1	786	31.9	14,461	160	49.7
Southern Region:													
Atlantic Coast Line.....1926	22,184	25,072	47,256	2.9	16,204	1,434	552	22.4	397	29.8	3,807	130	75.5
1925	20,068	19,912	39,980	4.1	16,063	1,374	531	20.8	406	31.7	3,331	126	75.4
Central of Georgia.....1926	5,029	9,255	14,284	3.1	16,053	1,280	569	25.2	501	29.3	3,754	159	72.3
1925	4,090	6,964	11,054	4.3	15,614	1,198	541	23.8	572	32.9	3,314	156	71.7
I. C. (inc. Y. & M. V.)..1926	41,136	22,098	63,234	4.3	21,707	1,700	736	26.7	695	40.1	7,057	144	71.8
1925	49,180	20,179	69,359	4.2	22,046	1,780	752	25.7	592	35.6	6,600	137	63.4
Louisville & Nashville.....1926	43,448	20,008	63,456	6.8	14,059	1,270	608	32.2	579	29.7	7,319	184	92.6
1925	42,551	18,368	60,919	7.8	14,254	1,224	587	30.7	518	26.6	6,281	182	85.1
Seaboard Air Line.....1926	12,081	18,853	30,934	1.5	14,641	1,399	570	23.2	412	27.5	3,265	156	68.3
1925	10,588	13,547	24,135	3.1	14,093	1,320	530	22.0	452	30.8	2,904	150	79.5
Southern System 1926	52,537	32,636	85,173	4.9	16,652	1,336	553	23.4	482	31.6	5,109	173	65.2
1925	50,880	31,488	82,368	7.7	17,070	1,334	551	22.2	442	29.1	4,473	163	56.8
Northwestern Region:													
Chic. & North Western...1926	47,910	26,980	74,890	7.0	15,849	1,310	524	22.4	331	23.5	2,934	158	52.7
1925	48,457	25,383	73,840	10.3	15,325	1,283	536	22.6	314	21.3	2,736	155	46.0
Chic., Milw. & St. P.....1926	54,370	20,064	74,434	6.0	19,610	1,615	690	23.6	454	28.8	3,020	157	51.2
1925	54,106	20,464	74,570	9.1	18,478	1,553	680	24.3	443	27.3	2,956	164	47.2
Chic., St. P., Minn. & Om.1926	3,066	8,150	11,216	12.0	12,439	1,039	417	21.5	381	26.3	2,349	171	56.7
1925	3,581	9,122	12,703	9.6	12,924	1,067	444	22.3	343	22.0	2,396	160	53.9
Great Northern 1926	42,009	8,843	50,852	8.9	21,099	1,866	831	24.3	386	23.0	2,390	149	35.3
1925	45,381	10,580	55,961	7.6	19,007	1,734	796	24.9	327	18.9	2,221	154	32.0
M., St. P. & S. Ste. M..1926	18,179	5,883	24,062	4.6	13,245	1,206	522	22.1	371	24.2	2,040	133	51.8
1925	19,515	5,865	25,380	5.1	14,018	1,252	559	22.8	360	22.5	2,091	129	49.5
Northern Pacific 1926	34,288	6,907	41,195	7.4	22,552	1,791	794	23.8	499	29.6	3,156	154	44.4
1925	34,337	7,801	42,138	6.7	21,324	1,714	801	24.4	449	24.4	2,943	131	37.3
Oreg.-Wash. R. R. & Nav.1926	7,326	3,096	10,422	5.0	19,789	1,629	730	23.4	411	22.8	1,959	185	42.5
1925	5,852	3,636	9,488	3.7	18,885	1,548	708	24.5	425	23.1	1,849	198	40.6
Central Western Region:													
Atch., Top. & S. Fe (incl. P. & S. F.).....1926	56,323	14,982	71,305	7.0	24,694	1,768	662	21.6	448	31.8	3,149	126	56.1
1925	59,623	16,624	76,247	6.2	23,280	1,723	652	21.4	399	28.5	3,027	129	52.2
Chicago & Alton.....1926	9,916	4,367	14,283	6.3	17,656	1,452	586	25.0	407	27.1	5,690	172	66.9
1925	10,099	6,459	16,558	3.4	17,460	1,500	623	24.4	340	21.9	5,509	151	65.4
Chic., Burl. & Quincy....1926	50,674	16,622	67,296	6.1	21,945	1,722	768	25.7	561	34 1	4,036	152	52.1
1925	52,989	17,016	70,005	7.7	21,539	1,670	756	26.1	506	30.0	3,798	155	49.4
Chic., Rock I. & Pacific...1926	33,755	18,597	52,352	10.5	18,585	1,354	500	20.8	425	32.7	2,941	162	67.3
1925	33,345	18,516	51,861	10.9	17,028	1,290	515	20.8	426	29.7	2,916	161	60.8
Denver & R. G. Wn.....1926	11,524	2,893	14,417	3.2	17,078	1,617	734	25.8	343	19.4	1,940	200	34.6
1925	12,126	2,839	14,965	5.3	14,608	1,485	715	27.3	288	14.9	1,679	208	28.7
Oregon Short Line.....1926	7,995	3,881	11,876	6.0	21,801	1,547	671	24.5	594	34.2	2,781	136	52.8
1925	8,355	4,719	13,074	3.0	21,301	1,552	725	26.1	473	24.6	2,559	142	42.9
Southern Pac.—Pac. Lines.1926	32,383	26,185	58,568	6.6	21,829	1,820	686	22.6	561	38.8	3,838	130	64.6
1925	30,579	27,852	58,431	5.9	21,076	1,796	755	24.3	565	34.1	3,879	134	59.8
Union Pacific 1926	18,315	8,711	27,026	12.2	32,384	2,002	808	20.7	878	56.9	6,432	122	58.6
1925	19,007	8,019	27,026	13.4	29,913	1,937	821	21.0	719	43.8	5,272	130	45.9
Southwestern Region:													
Gulf, Colo. & S. Fe.....1926	10,941	3,958	14,899	2.8	25,677	1,850	793	26.8	469	28.6	3,685	110	67.0
1925	8,958	4,522	13,480	3.8	24,262	1,802	798	26.4	516	29.9	3,667	113	68.7
Mo.-Kans.-Tex. 1926	9,243	3,697	12,940	4.3	27,532	1,992	761	21.9	469	34.7	3,593	104	62.9
1925	8,334	5,397	13,731	4.4	26,135	2,031	790	23.0	446	32.2	3,424	106	57.6
Mo.-Kans.-Tex. of Tex....1926	327	9,508	9,835	9.6	20,383	1,531	592	22.3	336	24.4	2,378	110	40.1
1925	242	12,210	12,452	7.7	20,388	1,619	652	24.2	332	22.5	2,980	119	44.8
Missouri Pacific 1926	28,163	20,965	49,128	6.9	20,873	1,650	683	23.9	623	40.5	4,201	137	76.2
1925	28,627	20,008	48,635	8.4	18,551	1,560	676	24.9	605	36.9	4,045	139	74.4
St. Louis-San Francisco...1926	20,180	11,134	31,314	5.1	17,537	1,362	559	23.8	474	31.7	3,030	164	55.5
1925	19,610	10,361	29,971	5.2	16,580	1,240	518	23.5	480	31.7	2,993	165	60.1
Southern Pacific Lines (in Tex. and La.)[2].....1925	11,530	14,126	25,655	9.0	17,356	1,244	511	22.7	425	27.8	2,456	119	65.4
1925	10,642	15,134	25,776	8.3	17,863	1,326	563	24.7	493	30.6	2,859	116	69.4
Texas & Pacific.....1926	6,836	5,796	12,632	3.5	19,991	1,555	573	20.9	445	33.0	2,876	115	53.9
1925	6,628	6,375	13,003	8.1	17,956	1,442	542	21.6	411	29.9	2,735	135	51.8

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

General News Department

(*Continued from page* 1405)

a leading structural company. The second was a duplicate of the first in every respect except that the member connections were welded instead of riveted. The third was also welded but the members were reduced in size to compensate for the anticipated greater strength of welded connections. The fourth was of the same outline as the others but was made up of tubular sections instead of structural angle-bars.

The riveted truss failed at a load slightly under three times the design load, the welded truss of the same design failed at a load equal to 3.45 times the design load, the lighter welded truss at 3.3 times the design load, and the tubular truss at 3 times the design load. Failure in all trusses was by buckling of the compression chords at points isolated from joints. Weights of these trusses: Riveted truss 1,161 lb.; welded plate and angle truss, 1,079 lb.; welded tubular truss, 916 lb.

Missouri Pacific Celebrates 75th Anniversary

With a pageant and other elaborate entertainments, the Missouri Pacific plans to celebrate, in the week beginning July 4, the seventy-fifth anniversary of the breaking of ground for the construction of the first section of what is today the Missouri Pacific Railway.

In the stadium of the Washington University at St. Louis there will be presented an elaborate pageant in which more than 600 Missouri Pacific employees will take part. The stadium seats 25,000 persons and the performances are to be free to the public. The program has been prepared from the records of the railroad company and other historical data. Among the spectacular features will be portrayals of transportation in the early days by steamboat, stage coach and pony express; representations of the building of a railroad; a replica of the first locomotive and train and one of a modern locomotive. Music will be furnished by three bands made up of employees of the railway. President L. W. Baldwin has invited state officers and city officers from all parts of the Missouri Pacific system, as well as many other prominent people, in honor of whom there will be a banquet.

C. P. R.—C. N. R. Amalgamation Again Proposed

A renewal of his proposal for a consolidation of the Canadian Pacific and Canadian National as the first step toward a solution of Canada's serious taxation problems was made in the House of Commons at Ottawa last week by William F. Maclean, one of the Conservative members from Toronto.

"I am sure," he said in part, "that the consolidation of the Canadian Pacific with the Canadian National Railways would result in an enormous saving to the country, while it would make for a more satisfactory service. Today we have not only duplicate trains but duplicate head offices and management, and duplicate headquarters staffs, most of this due to the struggle for business between these rival concerns. We have also a duplicate express system and a duplicate telegraph service involving the upkeep of cables and one thing and another, all of which is costing the country a vast sum of money. The demand of the country today is that this unjustifiable duplication shall cease.

"It may be said that the two systems are necessary. Indeed, I understand that the Minister of Railways (Mr. Dunning) since coming into office has intimated that in his opinion the Canadian Pacific Railway should continue to operate independently and supply opposition. I think he is entirely wrong. There should be a consolidation of the two roads and the Canadian Pacific Railway should be merged into the Canadian National system. If that were done I believe that one headquarters staff in Montreal, reduced 50 per cent, could administer the two railways much better than they are now being managed by two independent staffs. We could take the best bridges, the best grades, the best approaches to the cities and towns, and work them into the reorganization, and in that way not only would we get a much better service on the main and branch lines, but the economies we would effect would amount to over $300,000,000 a year. Every day you see this rivalry between the two head offices in Montreal, and in addition, each maintains a big propaganda organization; each has men out every day canvassing for business, at enormous cost, and the public have to pay the piper.

"Just to give you an idea of what is menacing the railroads now, do you know how much the motor bus and the motor truck are cutting into the revenues of our railways today? The motor bus and the motor truck are getting all the local business; they are taking more and more revenue away from the railways every day, and water transportation will go on taking more and more traffic away from the railways, so that soon there will not be enough business, even if the country does grow—and it is going to grow—to make the railways a paying concern.

"I see nothing but bankruptcy ahead of the two great railway systems unless this consolidation is effected. The traffic returns brought down to the House recently show that there has been a a considerable falling off in traffic."

Large Exhibit at Fuel Association Convention

During the convention of the International Railway Fuel Association, held at the Hotel Sherman, Chicago, May 11 to 14, inclusive, an unusually extensive exhibit was assembled by 70 companies, member of the International Railway Supply Men's Association.

At the annual meeting of the International Railway Supply Men's Association, which was held during the exhibit, the following officers were elected for the coming year: President, F. S. Wilcoxen, Edna Brass Company; vice-president, F. P. Roesch, Standard Stoker Company; secretary, W. H. Harris, W. H. Harris Coal Company; treasurer, M. K. Tate, Lima Locomotive Works. Two new members of the Executive Committee were elected as follows: D. A. Witt, Detroit Lubricator Company, and E. H. Cooke, American Arch Company.

The names of the exhibitors, the appliances or products exhibited, and the representatives in attendance are as follows:

American Arch Company, New York.—Locomotive brick arches. Represented by W. L. Allison, J. Q. Anthony, A. W. Clokey, E. H. Cook, T. F. Ferguson, E. F. Harlan, R. J. Himmelright, E. T. Mulchy, W. W. Neal, J. P. Neff, W. E. Salisbury, H. B. Slaybaugh, M. R. Smith and A. M. Sucese.

American Locomotive Company, New York.—Three-cylinder locomotive model, power reverse gear, airtight steampipe casing, and drum box grease cellar. Represented by Robert Brown, Arthur Haller, W. S. Morris, G. P. Robinson and Geo. H. Weiler.

American Railway Appliances Company, New York.—Locomotive flue blower. Represented by L. D. Brown and J. W. Henry.

American Throttle Company, New York.—Multiple throttle valve. Represented by Bard Browne, E. A. Averill, W. A. Buckbee, E. J. Drewyour, C. R. Fairchild, Geo. Fogg, W. Grove, C. R. Hardy, H. V. Jones, N. T. McKee, J. F. Mourne, H. B. Oatley, R. M. Ostermann, R. R. Porterfield, G. E. Ryder, Osterman, R. R. Porterfield. G. E. Ryder, K. E. Stillwell and K. E. Stillwell and R. J. VanMeter.

American Water Softener Company, Philadelphia, Pa.—Three types continuous lime and soda water softeners, one type intermittent lime and soda water softener, Zealite water softeners, acid treaters, chemical feeders and sand filters. Represented by William T. Runcie.

Baldwin Locomotive Works, Philadelphia, Pa.—Photographs of locomotives and literature. Represented by W. H. Evans, C. H. Gaskill and F. A. Neely.

Ball Railroad Time Service, Chicago.—Time Service clocks and watches. Represented by J. H. Barkemeyer, C. W. Brechner, J. W. Dodge, Jr., L. L. Doty, C. W. Slemmons and F. A. Tinkler.

B & S Manufacturing Corporation, Hoboken, N. J.—Automatic drifting valve. Represented by Richard W. Braden.

Barco Manufacturing Company, Chicago.—Power reverse gears, lubricated balanced plug valves, flexible ball joints and smokebox blower fittings. Represented by W. J. Behlke, C. O. Jenista, R. P. Klein, A. S. Lewis, L. E. Livingston, J. L. McLean, C. L. Mellor, F. B. Nugent and E. H. Stiles.

Bethlehem Steel Company, Bethlehem, Pa.—Literature on Bethlehem auxiliary locomotive. Represented by F. M. Morley and J. R. Stuart.

Bird-Archer Company, New York.—Blow-off cocks; anti-pitting, anti-scaling and anti-foaming compounds. Represented by Miss K. Alten, C. A. Bird, J. J. Callahan, J. J. Clifford, J. A. McFarland, C. J. McGurne, Mr. Meuer, R. A. Wilsey and L. F. Wilson.

Boss Bolt & Nut Works, Chicago.—Represented by W. G. Willcoxen.

Bradford Corporation, New York.—Front end throttle valve. Represented by E. J. Barnett, A. C. Bodeau and J. C. Keene.

Coal Publishing Corporation, Evanston, Ill.—Represented by A. McKinstry and C. Wesley Edwards.

Dearborn Chemical Company, Chicago.—Water treatment for boilers. Represented by I. Bowen, L. P. Bowen, Nelson F. Dunn, W. M. Gemlo, Chas. M. Hoffman, John Nutting, Ira Rehmeyer and Harry Ross.

Detroit Lubricator Company, Detroit, Mich.—Locomotive force feed oilers; thermostatic heater; bulls-eye locomotive lubricators; automatic flange oilers, pendulum type; transfer filler, and improved standard lubricator. Represented by W. B. Drake and S. A. Witt.

Dickinson, Paul, Inc., Chicago.—Model of portable locomotive drafter; smoke jacks for cars and cabooses, and cast iron steam exhaust heads. Represented by A. E. Engman and C. W. Hansen.

Duff Manufacturing Company, Pittsburgh, Pa.—Lifting jacks. Represented by E. E. Thulin and E. N. Thulin.

Edna Brass Manufacturing Company, Cincinnati, Ohio.—Mechanical lubricators; injectors; hydrostatic lubricators; coal sprinklers; oil burners; boiler checks; line checks; water columns; fire extinguisher; Guide oil cups; water glasses, reflex type; water gage cocks, and boiler gage cocks. Represented by E. O. Corey and F. S. Wilcoxen.

Electric Service Supplies Company, Philadelphia, Pa.—Locomotive turbo generators; headlight and general railroad lighting projectors. Represented by B. D. Barger, J. F. Carper, T. M. Childs and J. W. Porter.

Franklin Railway Supply Company, New York.—Locomotive booster; power reverse gears, radial buffer, adjustable wedge, etc. Represented by J. L. Bacon, F. M. Ball, T. Caldwell, C. W. Coffin, F. H. Cunningham, C. Godfrey, W. T. Lane, A. L. Meston, J. L. Randolph, H. E. Seifried, J. Talty, T. P. Whelan and Paul Willis.

Galena Signal Oil Company, New York.—Represented by R. A. Greene, F. C. Langdon, and J. A. McNulty.

Garratt-Callahan Company, San Francisco, Cal.—Boiler preservative. Represented by A. H. Baker, J. G. Barclay, H. M. Gray and A. H. Hawkinson.

Graham-White Sander Corporation, Roanoke, Va.—Locomotive sanders. Represented by W. H. White.

Hanna Stoker Company, Cincinnati, Ohio.—Represented by F. K. Tutt.

Hudson Grate Company, Keokuk, Iowa.—Locomotive grates. Represented by A. W. Hulson, J. W. Hulson, P. J. Kaveney, W. L. Trout and O. L. Yocum.

Hunt-Spiller Manufacturing Corporation, Boston, Mass.—Gun iron cylinder bushings, valve bushings, cylinder packing rings, valve rings, piston and bull rings, crosshead shoes, floating rod bushings, and sectional packing ring. Represented by V. W. Ellet, E. J. Fuller, C. L. Galloway, F. W. Lampton and J. G. Platt.

Huron Manufacturing Company, Detroit, Mich.—Washout plugs and arch tube plugs. Represented by H. N. Reynolds, Midgley & Borrowdale, and E. H. Willard.

International Correspondence Schools, Scranton, Pa.—Represented by H. T. Pottinger.

Johns-Manville, Inc., New York.—High temperature cement; moulded insulation for air pump head; flexible locomotive cab pipe insulation; front end gasketing tape; pipe and boiler insulation; packings and gaskets. Represented by P. R. Austin, C. S. Clingman, P. C. Jacobs, F. C. Vandervoort, Jr., L. S. Wilbur and J. C. Younglove.

King Refractories Company, Buffalo, N. Y.—Monolithic baffles; high temperature cements and insulating cement. Represented by W. J. Dinwiddie and O. D. Horton.

Lehon Company, Chicago.—Roofing cement; roofing, insulating and waterproofing papers. Represented by J. E. Eipper.

Leslie Company, Lyndhurst, N. J.—Turbo generator and steam heat pressure regulators. Represented by J. J. Cizek and O. C. Keckley.

Lima Locomotive Works, Lima, Ohio.—Pictures of new two cylinder steam locomotive. Represented by M. K. Tate and W. H. Winterrowd.

Locomotive Firebox Company, Chicago.—Thermic syphons. Represented by John Baker, Fred Bramley, Harry Clewer, Jr., Thos. F. Klein, L. R. Pyle, C. M. Rogers, C. A. Seley, A. A. Taylor and A. M. Wheeler.

Locomotive Stoker Company, Pittsburgh, Pa.—Duplex locomotive stoker; Elvin shovel type locomotive stoker, and locomotive coal pusher. Represented by T. Baldwin, J. B. Ball, J. J. Byrne, H. C. Cale, W. T. Capps, W. G. Clark, G. A. Edwards, V. B. Emerick, E. R. Funk, H. C. Huston, E. F. Milbank, C. E. Peterson, E. Prouty, E. Ryan, F. H. Smith, K. M. Stoller, A. M. Willsie, A. L. Wipple and H. C. Woodbridge.

MacLean-Fogg Lock Nut Company, Chicago.—Lock nuts. Represented by J. W. Fogg.

Manning, Maxwell & Moore, Inc., New York.—Pressure gages; safety valves; inspirators, and other boiler fittings. Represented by C. L. Brown, J. H. Bush, C. W. Corning, P. H. Ryan, J. Soule Smith and J. P. Walsh.

W. H. Marshall & Company, Chicago.—Prepared bituminous coal for stoker and hand-fired locomotives. Represented by C. N. Claar and John D. Kline.

Mudge & Company, Chicago.—Spark arrester for locomotives. Represented by Frank H. DeBrun and Arthur R. Fletcher.

Nathan Manufacturing Company, New York.—Injectors, lifting and non-lifting; water columns; low water alarm; hydrostatic and mechanical lubricators. Represented by Frederick C. Davern, Mr. Ehnor, C. J. Hatz, T. J. Murphy, W. R. Walsh and Richard Welsh.

National Boiler Washing Company, Chicago.—Represented by Fred W. Gale.

National Railway Devices Company, Chicago.—Radial fire doors. Represented by E. J. Gunnison and Jay G. Robinson.

National Refining Company, Chicago.—Railway lubrication. Represented by Gus Johnson, O. Leath, Harry Oakes, Grover Rohow and E. Simms.

Norton, A. O., Inc., Chicago.—Lifting jacks. Represented by R. J. McKay and C. H. Smith, Jr.

Ogle Construction Company, Chicago.—Photographs of coaling stations, coal and ash handling plants; coal, ash and sand handling machinery. Represented by J. G. Forster.

Ohio Injector Company, Chicago.—Lubricators; automatic flange oiler; injectors; fire jet; low water alarm; automatic graduating drifting valve; boiler fittings; combination boiler check and stop valve; hose strainer; injector starting valve. Represented by C. B. Allen, A. C. Beckwith, F. B. Farnsworth, W. H. Malone and C. G. Sauerberg.

Okadee Company, Chicago.—Blow-off valve; front end hinge; tender hose coupler; water glass protector, etc. Represented by W. H. Heckman, A. G. Hollingshead, Frank Kearney, Chas. R. Long, Jr. and G. S. Turner.

Paxton-Mitchell Company, Omaha, Nebr.—Metallic packing. Represented by L. J. McConnell and H. J. Molloy.

Pilliod Company, New York.—Valve gear. Represented by W. H. Bellmaine, J. H. Cooper and F. Fisher.

Pilot Packing Company, Chicago.—Packing, decarbonizer, drifting valve, sheet packing. Represented by W. W. Bacon and Robert Sinkler.

Piston Ring Company, Muskegon, Mich.—Piston and packing rings. Represented by E. W. Cadman.

Plant, L. G., Chicago, representing the Locomotive Terminal Improvement Company and the T. W. Snow Construction Company.—Direct steaming system for engine terminals; locomotive coaling stations; locomotive cinder pits and loaders. Represented by L. G. Plant and F. S. Wichman.

Pyle-National Company, Chicago.—Turbo generators for locomotive lighting, train control, train lighting and industrial purposes; headlights; classification, marker and back-up lamps; floodlights for all purposes; safety-first switches, plugs and receptacles, and heavy conduit fittings for railroad use; a complete line of fittings for train control and locomotive wiring. Represented by J. A. Amos, J. V. Baker, E. H. Hagensick, G. E. Haas, J. Will Johnson, R. L. Kilker, Wm. Miller, W. A. Ross and Walter Smith.

Railway Journal, Chicago.—Copies of publication. Represented by J. A. Williams.

Railway Purchases & Stores, Chicago.—Copies of publication. Represented by Ed. Wray.

Railway Review, Chicago.—Copies of publication. Represented by A. D. McIntyre and Harry G. Miller.

Roberts & Schaefer Company, Chicago.—Automatic electric locomotive coaling plant, locomotive "N. & W." type cinder plant; "N. & W." type engine coaler and cinder plant; coal tipple

and air cleaning plant, and samples of air cleaned coal. Represented by Jerome E. Machamer and Benj. B. Shaw.

Sargent Company, Chicago.—Water column; water glass protector; blower valve; gage cocks, and water glass gaskets. Represented by Geo. H. Sargent and L. L. Schultz.

Simmons-Boardman Publishing Company, New York.—Copies of *Railway Age* and Railway Mechanical Engineer. Represented by J. M. Rutherford, H. C. Wilcox and C. B. Peck.

Standard Oil Company (Indiana), Chicago.—Represented by R. G. Dudley, C. J. Henry, E. G. Lowe, W. O. Schorr and E. F. Tegtmeyer.

Standard Stoker Company, New York.—Working model of stoker; bulletins and other descriptive matter. Represented by Chris. T. Hansen, Henry S. Mann, A. E. Patterson, Frank P. Roesch, Geo. Rush, Robert Slacks and W. C. Thorp.

Steam Coal Buyer, St. Louis, Mo.—Copies of publication. Represented by John A. Harris.

Superheater Company, New York.—Superheater; exhaust steam injector and feedwater heater. Represented by E. A. Averill, Bard Browne, W. A. Buckbee, E. J. Drewyour, C. R. Fairchild, Geo. Fogg, W. Grove, C. R. Hardy, H. V. Jones, N. T. McKee, J. F. Mourne, H. B. Oatley, R. M. Ostermann, R. R. Porterfield, G. E. Ryder, K. E. Stillwell and R. J. VanMeter.

Transportation Devices Corporation, Indianapolis, Ind.—Mechanical cut-off control; cut-off indicator. Represented by Frank H. Lutz and E. S. Pearce.

Union Asbestos & Rubber Company, Chicago.—Insulating tapes and various insulating materials. Represented by Geo. H. Hull, J. K. Kuhns and Geo. J. Martin.

Union Draft Gear Company, Chicago.—Model friction draft gear. Represented by J. A. King, F. Schmitz and J. A. Tarelton.

Viloco Railway Equipment Company, Chicago.—Sander, metallic rod packing, packing segment boring machine; rail washer. Represented by W. H. Heckman, A. G. Hollingshead, Frank Kearney, Chas. R. Long, Jr. and G. S. Turner.

Wayne Tank & Pump Company, Fort Wayne, Ind.—Water softener. Represented by R. H. Langston and E. L. Marchant.

Worthington Pump & Machinery Corporation, New York.—Locomotive feedwater heater. Represented by J. E. Alves, J. E. Buckingham, Wm. Christiansen, A. G. Clark, D. R. Coleman, J. P. Collins, J. F. Cosgrove, E. C. Jackson, J. M. Lammedee, Geo. Law, T. E. McGowan, G. R. Mulqueeney, F. F. Murray, W. C. Norling, V. G. Oliver, R. H. Ramey, G. P. Schumaker, F. B. Smith and C. I. Williams.

OPERATING REVENUES AND OPERATING EXPENSES OF CLASS I STEAM ROADS IN THE UNITED STATES

(For 188 Steam Roads, Including 13 Switching and Terminal Companies)

For the Month of March, 1926 and 1925

Item	United States		Eastern District		Pocahontas Region		Southern Region		Western District	
	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925
Average number of miles operated	237,087.21	236,822.24	59,345.84	59,546.77	5,541.29	5,530.46	38,699.75	38,516.01	133,500.32	133,229.00
Revenues:										
Freight	$401,197,215	$360,778,940	$183,690,793	$162,185,047	$19,906,713	$16,275,923	$60,818,852	$54,558,974	$136,780,855	$127,758,996
Passenger	a 80,778,609	b 79,587,794	38,557,286	38,002,623	1,826,926	1,913,651	13,638,526	12,619,434	26,755,871	27,052,086
Mail	8,092,088	8,214,430	3,104,716	3,170,736	203,395	224,758	1,218,937	1,159,752	3,565,040	3,659,184
Express	13,231,673	12,084,540	6,425,084	6,030,907	304,108	292,096	2,000,091	1,730,871	4,502,390	4,030,666
All other transportation	16,688,074	16,127,306	9,557,073	9,242,561	183,618	271,960	1,942,198	983,517	5,905,185	5,629,268
Incidental	9,797,656	9,252,615	4,929,197	4,545,409	407,862	376,977	1,504,694	1,279,417	2,955,903	3,050,812
Joint facility—Cr.	1,026,626	836,680	412,623	350,151	10,555	15,021	138,723	144,213	464,725	327,295
Joint facility—Dr.	358,476	214,442	123,542	101,699	1,961	2,773	33,535	37,980	199,438	71,990
Ry. operat'g revenues.	530,453,465	486,667,863	246,553,230	223,425,735	22,841,218	19,367,613	80,328,486	72,438,198	180,730,531	171,436,317
Expenses:										
Maintenance of way structures	66,639,331	61,052,110	27,335,291	25,680,443	3,030,000	2,732,702	10,487,721	9,051,136	25,786,319	23,587,829
Maintenance of equipm't	112,942,784	108,959,835	54,990,595	53,288,906	5,214,246	4,823,167	14,818,280	13,271,214	37,919,663	37,576,548
Traffic	9,167,249	8,380,222	3,382,158	3,130,876	252,612	217,736	1,672,035	1,512,301	3,860,444	3,519,309
Transportation	188,572,508	181,068,374	90,810,930	85,832,584	6,194,318	5,799,007	27,349,948	24,839,648	64,217,312	64,597,135
Miscellaneous operat'ns.	4,516,630	4,166,253	2,044,888	1,906,450	95,959	95,655	689,903	580,136	1,685,880	1,584,012
General	15,727,723	14,784,182	7,291,464	6,495,528	483,972	470,457	1,983,082	1,872,781	5,969,205	5,949,416
Transportation for investment—Cr.	1,093,173	1,010,125	100,452	217,855	13,991	13,415	220,932	116,958	757,798	661,897
Ry. operat'g expenses.	396,473,052	377,400,851	185,754,874	176,116,932	15,257,116	14,125,309	56,780,037	51,010,258	138,681,025	136,148,352
Net revenue from railway operations	133,980,413	109,267,012	60,798,356	47,308,803	7,584,102	5,242,304	23,548,449	21,427,940	42,049,506	35,287,965
Railway tax accruals	31,004,581	28,281,982	12,581,045	11,391,607	1,529,032	1,228,160	4,477,202	4,133,026	12,417,302	11,529,189
Uncollectible ry. rev's.	161,209	124,370	85,579	41,498	3,185	3,201	16,346	20,518	56,099	59,153
Ry. operating income.	102,814,623	80,860,660	48,131,732	35,875,698	6,051,885	4,010,943	19,054,901	17,274,396	29,576,105	23,699,623
Equipm't rents—Dr. bal.	6,388,259	5,555,452	3,588,012	3,052,519	d 698,736	d 388,023	1,608,620	1,090,358	1,890,363	1,800,598
Joint facility rent—Dr. balance	1,903,406	1,929,941	866,614	812,740	91,478	87,938	103,238	108,619	842,076	920,644
Net ry. oper'g income.	94,522,958	73,375,267	43,677,106	32,010,439	6,659,143	4,311,028	17,343,043	16,075,419	26,843,666	20,978,381
Ratio of expenses to revenues (per cent)	74.74	77.55	75.34	78.83	66.80	72.93	70.68	70.42	76.73	79.41

For Three Months Ended with March, 1926 and 1925

Average number of miles operated	237,035.63	236,808.70	59,357.76	59,555.92	5,538.07	5,531.41	38,699.75	38,499.65	133,440.05	133,221.72
Revenues:										
Freight	1,089,041,320	1,048,490,773	482,807,090	469,224,530	57,014,197	49,914,971	166,543,480	151,993,350	382,676,553	377,357,922
Passenger	c 248,877,894	e 245,925,802	118,110,394	117,149,222	5,493,654	5,707,007	43,899,918	40,015,190	81,373,928	83,054,383
Mail	23,689,359	24,007,953	8,869,592	9,160,027	629,817	656,428	3,584,544	3,431,737	10,605,406	10,759,761
Express	32,172,036	32,094,088	15,111,686	15,051,495	730,966	767,501	4,961,202	4,775,969	11,368,182	11,499,123
All other transportation.	46,911,358	46,475,153	26,512,143	26,358,825	548,539	622,546	2,911,350	2,805,966	16,939,326	16,687,856
Incidental	28,927,899	27,882,201	14,485,742	13,828,424	1,121,575	1,002,196	4,515,627	3,950,651	8,804,955	9,100,930
Joint facility—Cr.	3,175,233	2,629,075	1,288,699	1,184,947	42,213	46,153	417,674	394,368	1,426,647	1,003,607
Joint facility—Dr.	1,141,939	633,058	394,447	302,775	5,921	6,433	101,564	104,090	640,007	219,760
Ry. operat'g revenues.	1,471,653,160	1,426,872,027	666,790,899	651,654,695	65,575,040	58,710,369	226,732,231	207,263,141	512,554,990	509,243,822
Expenses:										
Maintenance of way and structures	184,294,583	173,031,504	78,580,227	74,853,316	8,587,924	8,031,347	29,916,239	26,850,128	67,210,193	63,296,713
Maintenance of equipm't	319,237,073	318,931,358	153,376,558	154,961,525	14,773,468	14,068,795	42,041,688	39,217,274	109,045,359	110,683,764
Traffic	27,080,235	25,122,575	9,881,420	9,293,992	727,448	662,162	5,107,651	4,643,158	11,363,716	10,523,263
Transportation	548,964,630	546,704,227	260,933,671	258,621,431	18,673,583	17,762,575	79,902,367	73,707,962	189,455,009	196,612,259
Miscellaneous operat's.	13,404,665	12,572,738	6,210,344	5,949,075	289,350	275,194	2,040,959	1,748,009	4,864,012	4,600,460
General	45,677,551	43,148,480	21,071,789	19,123,227	1,391,410	1,390,730	5,862,094	5,525,486	17,352,258	17,109,037
Transportation for investment—Cr.	2,946,575	2,462,222	333,164	453,811	59,188	56,902	651,544	399,152	1,902,679	1,552,357
Ry. operat'g expenses.	1,135,712,162	1,117,048,660	529,720,845	522,348,755	44,383,995	42,133,901	164,219,454	151,292,865	397,387,868	401,273,139
Net revenue from railway operations	335,940,998	309,823,367	137,070,054	129,305,940	21,191,045	16,576,468	62,512,777	55,970,276	115,167,122	107,970,683
Railway tax accruals	87,717,101	82,337,462	33,867,904	31,896,210	4,572,408	3,677,005	13,074,402	11,800,170	36,202,387	34,964,077
Uncollectible ry. rev's.	398,328	395,563	208,229	157,752	11,340	21,613	38,306	51,388	140,453	164,810
Ry. operating income.	247,825,569	227,090,342	102,993,921	97,251,978	16,607,297	12,877,850	49,400,069	44,118,718	78,824,282	72,841,796
Equipm't rents—Dr. bal.	18,452,853	17,351,429	9,665,383	9,203,132	d 1,909,585	d 1,445,065	5,290,194	2,771,973	5,406,861	6,821,389
Joint facility rent—Dr. balance	5,813,952	5,132,931	2,412,333	2,197,916	312,414	288,615	309,417	298,051	2,779,788	2,348,349
Net ry. oper'g income	223,558,764	204,605,982	90,916,205	85,850,930	18,204,468	14,034,300	43,800,458	41,048,694	70,637,633	63,672,058
Ratio of expenses to revenues (per cent.)	77.17	78.29	79.44	80.16	67.68	71.77	72.43	73.00	77.53	78.80

a Includes $3,476,471 sleeping and parlor car surcharge. b Includes $3,123,998 sleeping and parlor car surcharge. c Includes $9,922,313 sleeping and parlor car surcharge. d Deficit or other reverse items. e Includes $8,831,947 sleeping and parlor car surcharge.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

To Hold Railroad Labor Institute

A "Railroad Labor Institute," similar to that conducted last summer, will be held this year at the Brookwood Labor College at Katonah, N. Y., on August 1-14. During the first week of the institute the program calls for the study of "The Background of Railroad Labor Problems." Under this heading are included the following topics:

The Development of Railroading to the Position of a Basic Industry.
Control and Management of the Railroads.
The railroad charter and corporation.
Systems, pools, consolidations.
Administration, finance, accounting expenses, operation of railroads.
Government regulation of railroads.
Labor and the Railroads.

During the second week the general topic for discussion will be "Current Railroad Labor Problems." This discussion will include:

Railroad Labor Disputes and Grievances.
Organizing Unorganized Railroad Employees.
Organizing methods.
Overcoming the menace of company unionism.
What should be done about company fraternalism?
Labor's Interest in Railroad Regulation and Valuation.
Enlarging the Scope and Usefulness of the Railroad Unions.
The Railroad Wage Problem.
How may the railroad unions increase the wage income of the worker?
Modern thought, methods, and technique in wage negotiations.

The educational director of the institute, who will have general charge of all the discussions, is Dr. Arthur W. Calhoun, instructor in social economics on the Brookwood faculty.

A.S.M.E. to Hold Spring Meeting in San Francisco

Final arrangements have been completed for the spring meeting of the American Society of Mechanical Engineers to be held at San Francisco, June 28 to July 1, 1926. The program includes a number of subjects of interest to railroad men. On Tuesday morning, June 29, there will be papers presented on the Growth of University Extension Training of the Non-College Type for the Industries of the West, and on Education and Training of Apprentices on the Pacific Coast. A joint meeting of the Fuel and Railroad Divisions is scheduled for Wednesday morning, June 30, at which session papers on Combined Oil and Gas-Burning Furnaces for Power Plant Use; Fuel Oil for Railways, and the Development of the Caterpillar Tractor and Its Application to Industry, will be presented. Following is the program of the spring meeting:

MONDAY, JUNE 28

Morning—Council meeting.
Conference of local sections delegates.
Meeting nominating committee.
Afternoon—Excursion to Muir Woods and alternate excursions. Shopping trips for ladies.
Evening—Reception and dance.

TUESDAY, JUNE 29

Morning—Meeting nominating committee.
Simultaneous sessions.
Petroleum—
Fluid Flow in Pipes of Annular Cross-section, by D. H. Atherton.
Mechanical Engineering in Cracking, Heating and Cooling of Oil, by B. N. Broido.
The Termination of Charcoal Tests, by F. L. Kallam.
Industrial Training and Education—
The Growth of University Extension Training of the Non-College Type for the Industries of the West, by John L. Kerchen.
Education and Training of Apprentices on the Pacific Coast, by Paul Eliel.
Afternoon—Steamer trip on San Francisco Bay. Ladies' bridge party.

WEDNESDAY, JUNE 30

Morning—Meeting nominating committee.
Simultaneous sessions.
Fuels and Railroad—
Combined Oil and Gas-Burning Furnaces for Power Plant Use, by J. Grady Rollow.
Fuel Oil for Railways, by J. C. Martin, Jr.
The Development of the Caterpillar Tractor and Its Application to Industry, by Pliny E. Holt.
Hydraulic—
Aspects of Steam Power in Relation to a Hydro Supply, by A. H. Markwart.
Water Power and Steam Power in California Utilities, by H. A. Barre.
Speed Changes of Hydraulic Turbines for Sudden Changes of Load, by E. B. Strowger and S. Logan Kerr.
Oil and Gas Power—
Transmission of Power on Oil-Engine Locomotives, by A. I. Lipetz.
Oil Engines as a Drive for Pipe Line Pumps, by F. Thilenius.
Uniform Methods of Calculating the Periodic Displacement and Oscillations in Synchronous Machines, by C. W. Cutler.
Afternoon—Auto tour around San Francisco.
Excursions.
Ladies' tea at Fairmount Hotel.
Evening—Banquet.

Traffic News

The Seaboard Air Line announces a new fast train to Florida, the "Southerner," the first train to leave New York on May 24, at 9:15 a. m.

The Burlington Refrigerator Express will be organized on June 1 by the Chicago, Burlington & Quincy to operate its refrigerator cars and its perishable freight handling facilities.

A fruit and vegetable marketing and demonstration train will be operated by the Chicago & Eastern Illinois over its lines during the month of June, in co-operation with the state universities, the United States Department of Agriculture and the state agricultural departments. The purpose of the demonstration is to give the fruit and vegetable growers information as to how to grade, correctly pack and market their products to obtain the best returns.

Reduced Round Trip Fares on Trunk Lines

From May 28 to November 30, fifteen-day round trip tickets will be sold from Chicago to New York and Philadelphia. Tickets will be honored on all trains with the exception of the Twentieth Century Limited of the New York Central and the Broadway Limited of the Pennsylvania. The round trip rate to New York will be $50.68 and to Philadelphia $44.20.

Reduced Fares for Catholic Congress

A special rate of a fare and one-half for a round trip will be put into effect in the Eastern Region during the Eucharistic congress at Chicago in June. The Central Passenger Association grants a fare and one-half for the round trip for passengers in sleeping cars and one fare for the round trip for passengers traveling in coaches. The Trunk Line and New England Passenger associations have granted a rate of a fare and one-half for the round trip in either coaches or sleeping cars.

New England Shippers' Advisory Board

The New England Shippers' Advisory Board, William F. Garcelon, chairman, held its first annual meeting in Boston on May 12, with an attendance of over 500, two-thirds of whom were railroad men. Commodity committees to the number of 58 presented reports, substantially all of them being very optimistic. Some of them predicted increases in business varying from five per cent to 30 per cent for the next six months. Among the speakers were G. C. Randall, A. R. A.; Lieut. Col. Jones, U. S. A.; C. M. Macdonald, freight claim agent of the Boston & Maine; F. C. Arnoult and Homer Loring.

Mr. Arnoult, traffic manager of the Colonial Air Transport, gave a brief review of conditions and prospects in the commercial aviation field. Mr. Loring, chairman of the Boston & Maine, said that store-door delivery, which the Boston & Maine has been experimenting with during the past year, has proved of value to shippers; and he thinks that its importance will increase. He said that by the end of this year the Hoosac Tunnel will be enlarged so as to permit the passage of higher freight cars. The Boston & Maine is consolidating and improving its freight house facilities at the Boston terminus.

Freight Traffic for March and Three Months

For the three months ending, March 31, the volume of freight moved by the Class I railroads amounted to 111,766,071,000 net ton miles, which tops that of any corresponding period on record, according to reports compiled by the Bureau of Railway Economics. This exceeded two per cent the previous high record, made during the first three months in 1923, and exceeded the first three months of 1925 by 5,838,682,000 net ton miles, or 5.5 per cent. The movement in the Eastern district increased seven per cent over that of the corresponding period last year, in the Southern district 12.1 per cent and in the Western district seven-tenths of one per cent. The total for March was 38,672,095,000 net ton miles. This was the second greatest March on record, having been exceeded only

in 1923, when the total was 1.4 per cent greater. The total this year was 9.5 per cent above March last year. March in the Eastern district showed an increase of 12.5 per cent over 1925, in the Southern district 11.4 per cent and in the Western district 4.1 per cent.

The daily average movement of freight cars in March was the highest for any March on record, the average was 29.3 miles per day, an increase of 2.9 miles over that of March, 1925, and 2.1 miles over March, 1924. It also was an increase of 2.3 miles over March, 1923. The average load per car was 26.4 tons, an increase of three-tenths of a ton above that of March last year but one-fifth of a ton below that of March, 1924, and one and two-fifth of a ton below March, 1923.

Florida Embargo Lifted

Due to the great improvements in the railroad transportation situation that have taken place recently in Florida the Car Service Division of the American Railway Association has announced, effective at midnight, May 16, the lifting of the state-wide embargo on freight shipments into that state which has been in effect since October 29, 1925. As the general situation has improved modifications have been made in the embargo, the last one having been on April 15, when it was made to include only lumber and cement. Carload traffic to Florida for the first three months this year showed an increase of 102.9 per cent over the same period in 1924 and 58.5 per cent over the same period in 1925. The railroads are meeting the transportation situation in Florida more satisfactorily than they have at any time since last summer. Demands particularly for road building materials have increased enormously in the past year and are increasing daily.

Railroads, Waterways, Trucks and Buses

"Railroads, waterways, trucks and buses must be classed together as essential forms of modern transportation, and the service rendered by each should be analyzed on the basis of merit and of profit to the user," according to J. E. Gorman, president of the Chicago, Rock Island & Pacific, speaking before the Traffic Club of Minneapolis, Minn., at a luncheon on May 13, celebrating "Rock Island day." "The United States is going to have waterways because the people want them. When they are developed the people will use them as much as they find it profitable and no more. Motor trucks and buses travel American highways in increasing numbers and they are here to stay. The Rock Island and all other railways are free to engage in bus and truck business if they so desire.

"The steam railroads can meet waterway and highway competition effectively by minding their business and furnishing such efficient service that the public will prefer it to any other. The people of the United States demand good service and they never have enjoyed such good service, in respect to transportation, as that of recent years."

Great Lakes Regional Advisory Board

The annual meeting of the Great Lakes Regional Advisory Board was held at the Hotel Statler, Detroit, Mich., on May 13 with over 800 industrial and railroad representatives in attendance, including 24 railroad presidents mostly from large roads. Frank H. Alfred, president of the Pere Marquette made the principal address, on "The Leavener of Transportation"—that is, the regional advisory board. The forecast made in the reports of the commodity committees indicates that the requirements for the next four months will be equal to or greater than for the same period in 1925. The carriers reported facilities adequate to meet all demands.

A luncheon was given by Roy D. Chapin at the Detroit Athletic Club, bringing together the heads of America's railroads and the men who are largely responsible for the advancement of motor vehicle transportation. At the banquet in the evening, W. W. Atterbury, president of the Pennsylvania, was the first speaker on the program and lauded the results that have been obtained through the operations of the regional advisory board. Arthur T. Waterfall, vice-president of Dodge Brothers spoke on the relation of highway transportation to railroad transportation, giving facts showing that highway transportation is chiefly employed as a distributive agency; a necessary supplement to rail transportation rather than a competitor.

The present officers of the Board were unanimously re-elected: L. G. Macomber, Detroit, Mich., president; K. A. Moore, vice-president, and Frank H. Baer, Cleveland, Ohio, general secretary.

Of the more than 800 persons in attendance about one-half were shippers and one-half railroad men. Many nationally known industrial executives were present. Among the railroad representatives were the following presidents: E. D. Bronner (Detroit Terminal), W. L. Ross (D. & T. Shore Line), A. E. Clift (Chicago & Ill. W.), A. C. Needles (N. & W.), Fred Sargent (C. & N. W.), L. A. Downs (C. Ga.), J. E. Taussig (Wabash), Ralph Budd (G. N.), E. E. Loomis (L. V.), Henry Ford (D. T. & I), Charles Donnelly (N. P.), Sir Henry Thornton (C. N. R.), P. E. Crowley (N. Y. C.), F. D. Underwood (Erie), F. H. Alfred (P. M.), Hale Holden (C. B. & Q.), J. M. Davis (D. L. & W.), N. L. Howard (C. G. W.), W. J. Harahan (C. & O.), C. T. Jaffray (M. St. P. & S. S. M.), J. N. Beckley (T. H. & B.), T. C. Powell (C. & E. I.), A. B. Newell (Toledo Terminal).

Motor Transport News

The governor of New York has signed the Thayer bill, which is Chapter 846 of the laws of 1926, which will add stage lines, motor vehicle lines, etc., to the paragraph in section 54 of the Public Service Commission Law authorizing the holding of stock of another transportation corporation.

Railroads Permitted to Operate Buses in New York

The governor of New York has approved the bill, passed by the recent legislature, adding a new section, 50a, to Chapter 48 of the Consolidated Laws, so as to permit (under the authority of the Public Service Commission) the substitution of buses for cars on street surface or other railroads. "Whenever the commission shall be of the opinion, after a hearing * * * that the public interest will be served by the operation of stages, buses or motor vehicles in place of cars or trains upon tracks, on any portion of the route of such railroad, the commission may make an order," etc. The order, however, must have the consent of the city, town or village authorities.

A Newspaper Advertisement with a Special Appeal to the Private Automobile Owner

Commission and Court News

Interstate Commerce Commission

The commission has suspended from May 25 until September 22 the operation of proposed increases in the rates on phosphate rock, carloads, from the producing points in Florida to Roanoke, Alabama.

The commission has suspended until September 12 a proposed general increase in the freight rates on stone from Bedford and other points in Indiana to Missouri River crossings and points contiguous thereto.

The commission has suspended from May 11 until September 8 the operation of a proposed increase in the proportional freight rates on classes and commodities between Newport, Tenn., and points on the Tennessee and North Carolina.

The commission has suspended until September 12 a proposed increase in the freight rates on lime from East St. Louis and St. Louis and related points to destinations in Nebraska located on the Chicago, St. Paul, Minneapolis & Omaha.

The commission has suspended from May 20 until September 17 the operation of a proposed increase in the rates on class and commodity traffic from Scranton, Pa., and Williamsport, Pa., groups of origin points to central and western trunk line territories via certain routes of movement.

Rates on coal from Colorado and northern New Mexico producing districts to local points on the St. Louis-San Francisco, Missouri-Kansas-Texas, and Midland Valley have been found unreasonable and unduly prejudicial in a report on a complaint by the Public Utilities Commission of Kansas, in which rates to be observed for the future are prescribed.

The commission has suspended until October 5 the operation of schedules published in an American Railway Express Company's tariff which propose to restrict the number of attendants allowed free transportation with carload shipments of race horses, from six attendants to two attendants with each car, the rule to apply generally between points in the United States east of the Mississippi River and the Illinois-Indiana state line.

Responsive to requests therefor a conference was held on May 19 before Commissioner Campbell of the Interstate Commerce Commission relative to rates on iron and steel between points in Illinois Freight Committee territory, involved in Investigation & Suspension proceeding No. 2658. The rates were suspended because of complaints that discrimination against shippers from outside the Chicago district into that district would result from the fact that rates within the district and from Gary, Ind., to the district were not revised in harmony with the remaining rates. The primary purpose of the conference was to determine whether such readjustment of the rates may be brought about as will enable the suspension to be vacated without bearing and formal decision.

State Commissions

The New York State Public Service Commission has ordered elimination of the Elmwood Avenue grade crossing of the Erie and the Lehigh Valley tracks in Rochester, pursuant to the provisions of chapter 233 of the laws of 1926, which provides the legal machinery for the elimination of grade crossings under the $300,000,000 bond issue. This is the first crossing to be eliminated under the new law. Traffic now passing over Elmwood avenue is to be diverted to a new street and a new undergrade crossing about 450 ft. south of the existing crossing. The new under-crossing will consist of two double track, reinforced concrete bridges, of four spans each to be supported on concrete abutments and columns.

Equipment and Supplies

Locomotives

THE SOUTHERN PACIFIC has ordered one snow plow from the American Locomotive Company.

THE CHICAGO, WEST PULLMAN & SOUTHERN has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

THE RED RIVER LUMBER COMPANY has bought a 100-ton oil-electric locomotive from the Ingersoll-Rand Company, the American Locomotive Company and the General Electric Company, which companies co-operated in its manufacture.

THE NORTHERN PACIFIC has ordered 12 Mountain type locomotives from the American Locomotive Company. These locomotives will have 28 in. by 30 in. cylinders and a total weight in working order of 430,000 lb. Inquiry for this equipment was reported in the *Railway Age* of May 1.

THE UNION PACIFIC has ordered 14, 4-12-2 type three-cylinder locomotives from the American Locomotive Company. These locomotives will each have one cylinder 27 in. by 31 in. and two 27 in. by 32 in., and will have a total weight in working order of 495,000 lb. Inquiry for this equipment was reported in the *Railway Age* of May 8.

Freight Cars

THE LOUISVILLE & NASHVILLE is inquiring for 50 caboose cars.

THE BOSTON & MAINE has ordered six air dump cars from the Clark Car Company.

THE DELAWARE & HUDSON is inquiring for 300 composite hopper cars of 78 tons' capacity.

THE FRUIT GROWERS EXPRESS is inquiring for 1,200 steel underframes for refrigerator cars.

THE SOUTH AFRICAN RAILWAYS are inquiring through the car builders for 75 bogie fruit wagons.

THE HOCKING VALLEY has ordered two air dump cars from the Case Crane & Engineering Company.

THE UNION OIL COMPANY has ordered 35 tank cars from the General American Tank Car Corporation.

THE BROKEN HILL PROPRIETARY COMPANY, Australia, has ordered two air dump cars from the Clark Car Company.

THE ANDES COPPER MINING COMPANY has ordered 26 tank cars from the American Car & Foundry Company. This company was reported in the *Railway Age* of January 30 as inquiring for 25 tank cars.

THE CENTRAL OF NEW JERSEY has renewed its inquiry for box cars and is now inquiring for 1,000 box cars with an alternate bid on 800 box cars; bids are also wanted on 200 automobile box cars all of 50 tons' capacity.

THE ANGLO-MEXICAN PETROLEUM COMPANY has ordered five 3-compartment tank cars of 10,000-gal. capacity from the General American Tank Car Corporation. Inquiry for this equipment was reported in the *Railway Age* of April 3.

THE TENNESSEE CENTRAL is inquiring for 100 all-steel hopper cars of 55 tons' capacity; 100 drop bottom, all-steel coal cars of 50 tons' capacity; 25 steel underframe flat cars of 55 tons' capacity and 50 steel underframe, composite stock cars of 40 tons' capacity.

Passenger Cars

THE READING COMPANY is inquiring for four cafe cars.

THE SEABOARD AIR LINE is inquiring for from 15 to 20 all-steel passenger coaches.

THE GULF, MOBILE & NORTHERN is inquiring for two combination baggage and mail cars.

Iron and Steel

THE READING COMPANY is inquiring for 200 tons of steel for a bridge.

THE NORFOLK & WESTERN is inquiring for 200 tons of steel for five small bridges.

THE ATLANTIC COAST LINE is inquiring for 2,000 tons of steel for shops at Uceta, Fla.

THE WABASH is inquiring for 1,881 tons of structural steel for bridges at Decatur, Ill., Lafayette, Ind., and Detroit, Mich.

Machinery and Tools

THE SOUTHERN PACIFIC has ordered one 25-ton locomotive crane from the American Hoist & Derrick Co.

THE ATCHISON, TOPEKA & SANTA FE has ordered one 30-ton gantry crane from the Whiting Corporation.

THE LONG ISLAND has ordered a 1,500-lb. Chambersburg steam hammer from Manning, Maxwell & Moore, Inc.

THE LEHIGH VALLEY has ordered one 800-ton Chambersburg hydraulic wheel press from Manning, Maxwell & Moore, Inc.

THE ATCHISON, TOPEKA & SANTA FE has ordered three Putnam frog and switch planers from Manning, Maxwell & Moore, Inc.

THE NEW YORK CENTRAL has ordered one 28-in. motor driven engine lathe and one No. 5 Defiance horizontal boring mill from Manning, Maxwell & Moore, Inc.

THE UNION PACIFIC is inquiring for two 24-in. motor-driven floor grinders, one 18-in. motor-driven floor grinder, two motor-driven bar grinders, one 36-in. lathe, and one 42-in. lathe.

THE NASHVILLE, CHATTANOOGA & ST. LOUIS has ordered two 48-in. Putnam car wheel borers and one Putnam combination car journal and axle lathe from Manning, Maxwell & Moore, Inc.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered a 36-in. by 12-ft. planer from the Niles-Bement-Pond Company. This company is inquiring for one 48-in. by 48-in. by 12-ft. planer, two 24-in. heavy duty back geared lathes, and one 36-in. upright drill.

THE NILES-BEMENT-POND COMPANY has received orders from the railroad companies for machine tools as follows: A 48-in. car wheel borer; 48-in., 400-ton hydraulic wheel press; 90-in. heavy driving wheel lathe and a 90-in. standard driving wheel lathe.

Signaling

THE LONG ISLAND has contracted with the Union Switch & Signal Company for the installation of an electro-pneumatic interlocking, Model 14, for reconstruction at Vanderbilt avenue, Brooklyn, N. Y.; a 19-lever frame with the necessary signals, switch movements, relays and other apparatus. Color-light signals will be used.

THE PENNSYLVANIA has ordered from the Union Switch & Signal Company a 16-lever frame and other material for the enlargement of the interlocking at W U Tower, Walnut, Pa.; also electro pneumatic interlocking for improvements at Brownstown, Ill.; also for additions to the 24-lever machine at R K Tower, Millbrook, Ohio; also for 19 units, style S-8, and other material for F O Tower, Far Hope, Ohio.

THE PERE MARQUETTE has ordered from the Union Switch & Signal Company material for the installation of an automatic block system on its line between Alexis, Ohio, and Romulus, Mich.; 40 miles, double track. The order includes 76 light signals, 311 relays and other apparatus. Provision will be made for approach lighting of signals. Center-fed track circuits will be employed, the maximum block section being 8,000 ft. long.

Supply Trade News

The Flexo Supply Company has removed its office from 104 South Main street, to 4459 Manchester avenue, St. Louis., Mo.

The Cleveland Pneumatic Tool Company has removed its Boston, Mass., office from 60 High street to 142 Berkeley street.

The Timken-Detroit Axle Company has removed its New York City office from 2 Rector street to 41 East Forty-second street.

F. A. Ogden, Jr., dealer in railway car specialties, has removed his office from 1011 B. F. Jones building to 528 Fourth avenue, Pittsburgh, Pa.

Charles B. Officer, assistant to the president on engineering matters of the **Sullivan Machinery Company,** Chicago, has been promoted to chief engineer.

L. O. Stratton, representative of the **Buda Company,** with headquarters at Salt Lake City, Utah, has been promoted to district manager, with headquarters at St. Louis, Mo.

Walter C. Doering, representative of the **Bradford Corporation,** with headquarters at St. Louis, Mo., has been elected vice-president, with headquarters at Chicago. **William D. Otter** has been appointed manager of the Western district, with headquarters at San Francisco, Cal., to succeed W. W. Rosser, who has resigned to enter business for himself. Mr. Doering was born on September 12, 1886, in Bellville, Ill., and entered business with the St. Louis Car Wheel Company on January 1, 1900. This company was absorbed by the Southern Wheel Company in 1912, and until 1920 he held various positions with this company including assistant to the vice-president, and assistant to the president. In 1920 he was elected a vice-president. On January 1, 1923, Mr. Doering resigned from the Southern Wheel Company to engage in the railway supply business in St. Louis on his own account, representing the Bradford Corporation, the American Brake Shoe & Foundry Company, and the Pittsburgh Steel Products Company, which position he has held until his recent election.

W. C. Doering

J. H. Larmonth, Montreal, has been elected vice-president and **Gordon W. Dunn,** Montreal, has been elected vice-president and managing director of the **P. & M. Company, Limited.**

J. V. Conway, special railroad representative of the Chicago Pneumatic Tool Company, has resigned to become western railroad representative of the **Heywood-Wakefield Company,** with headquarters at Chicago.

The Magnus Company, Inc., will construct a branch plant at 29th and Blake streets, Denver, Colo., to cost approximately $100,000. The plant will include a foundry building 180 by 182 ft., of steel and brick construction.

James T. Waite, formerly New England sales engineer of the Whitman & Barnes Manufacturing Company, has been appointed general sales manager of the **New Process Twist Drill Company,** Taunton, Mass. **George R. Hine,** formerly

general superintendent of the Whitman & Barnes Manufacturing Company, has been appointed works manager of the New Process Twist Drill Company, in control of the company's entire line of manufacture.

Thomas O'Brien, after a service of 16 years as engineer and sales manager with the John F. Allen Company, New York, has left that company and become associated with the **Reliable Machine & Tool Company,** New York City, in a similar capacity.

George W. Morrow, supervisor of track of the New York, New Haven & Hartford, on June 1 will leave that position to join the sales staff of the **Ingersoll-Rand Company,** reporting to the Chicago office. He supplants E. F. Kultchar, who was recently transferred to the locomotive department.

Westinghouse Electric & Manufacturing Company

The annual report of the Westinghouse Electric & Manufacturing Company and its proprietary companies for the fiscal year ended March 31, 1926, shows net income available for dividends of $14,122,001 as compared with $15,324,364 in 1925. The income statement follows:

	Year ended March 31	
Gross earnings	1926	1925
Sales billed	$166,006,800	$157,880,292
Cost of sales	151,711,939	144,242,065
Net manufacturing profit	14,294,862	13,638,227
Other income	2,295,363	4,203,179
Gross income from all sources	16,590,225	17,841,406
Interest on bonds	2,468,224	2,517,042
Net income available for dividends and other purposes	$14,122,001	$15,324,364

Obituary

T. O'Malley, president of the O'Malley-Beare Valve Company, Chicago, died in that city on May 14, from acute indigestion.

Joseph C. Sibley, Sr., former chairman of the board of the Galena Signal Oil Company, died at his home near Franklin, Pa., on May 19, at the age of 76. Mr. Sibley had served several terms in Congress and retired from active business about fifteen years ago.

Trade Publications

MEEHANITE METAL.—A four-page, illustrated folder descriptive of Meehanite metal has been issued by the Whiting Corporation, Harvey, Ill. This metal is a pearlite iron having unusual physical properties with a tensile strength varying from 45,000 to 70,000 lb. per sq. in., as against 20,000 to 30,000 lb. for ordinary grey iron.

BUS EQUIPMENT.—This book is a complete catalog of bus accessories supplied by the Electric Service Supplies Company, Philadelphia and Chicago. In all 193 items are listed in its index. The book contains 191 pages, 6 in. by 9 in. It is attractively printed on gloss paper, richly illustrated with photographic reproductions, and well bound in cloth.

STEAM ECONOMY.—Catalogue S-22, descriptive of Republic installations in many industries and the theory and construction of steam flow meters, has been issued by the Republic Flow Meters Company, 2240 Diversey Parkway, Chicago. The information contained in the catalogue is a compilation of the experience of the company's engineering force, covering a period of five or ten years on the subject of methods for reducing steam costs.

VALVES.—Valves suitable for almost any condition encountered in industries using water, air, steam, acids, oils, heavy liquids, oil residue, high hydraulic pressures, etc., are listed in catalog No. 33, issued by the Homestead Valve Manufacturing Company, Homestead, Pa. A complete line of plug type valves is shown, also several new products, including the full round opening valve, the protected seat globe valve, the protected seat hydraulic operating valve, and the Homestead lubricated type valve.

Railway Construction

BALTIMORE & OHIO.—This company has awarded a contract to the U. G. I. Construction Company, Philadelphia, for the construction of a fruit auction sales building in that city; estimated cost, $500,000. A contract for plumbing for this building, to cost approximately $40,000 has been awarded to Boom & Sample, Philadelphia.

BOSTON & ALBANY.—This company has awarded a contract to the Railway Engineering & Construction Co., Boston, for the grading and construction of a new location for its Newton Lower Falls line from Pine Grove Station, Mass., to Riverside Station.

BOSTON & MAINE.—This company has authorized the rebuilding of its bridge 128.63 at Pattee, N. H., at an approximate total cost of $37,500. In this connection a contract for furnishing steel has been awarded to the Shoemaker Bridge Company ($8,000) and for foundations to A. Michelini & Son ($14,302).

CANADIAN PACIFIC.—A contract has been awarded to McDougall & Sons, Vancouver, B. C., for the construction of an express building at Calgary, Alberta, to cost $35,000.

CHICAGO & NORTH WESTERN.—This company has been authorized by the Interstate Commerce Commission to extend its line southward from Benld, Ill., 5.5 miles to a connection with the Litchfield & Madison, which, in turn, has been authorized to construct a one-mile extension northward to the point of connection.

COLUMBIA & COWLITZ.—The Interstate Commerce Commission has authorized this company to acquire a 2.6 mile line in Cowlitz county, Oregon, and to extend this line approximately 6 miles.

DENVER & RIO GRANDE WESTERN.—A contract has been awarded to the Utah Construction Company, San Francisco, Cal., for the grading of a six-mile extension from Helper, Utah, to Kenilworth, reported in the *Railway Age* of March 13.

FLORIDA EAST COAST.—This company has authorized work to cost approximately $3,788,150, details of which are as follows:

Nature of work	Location	Probable cost	Status of bids or contracts
Additional yard facilities	Ft. Pierce	$450,000	Bids closed May 4.
Freight house facilities	Daytona	100,000	Bids to be received when plans are completed.
Freight yard facilities	New Smyrna	350,000	Awarded.
Freight house facilities	Miami	225,000	Bids to be received when plans are completed.
Freight house and dray tracks	Lake Worth	100,000	Grading and trackwork awarded.
Relay 14 miles Titusville branch with 90 lb. rail	Maytown to La Grange	181,550	.....
Relay 14 miles Okeechobee branch with 90 lb. rail	New Smyrna to Maytown	181,600	.....
Locomotive shops	St. Augustine	1,300,000	Awarded to Foundation Company, N. Y.
Engine terminal	Hialeah	463,000	Awarded to Foundation Company, N. Y.
Engine terminal	Bowden	437,000	Awarded to Foundation Company, N. Y.

Other contracts awarded, some in connection with work listed as authorized above, are:

Nature of work	Location	Probable cost	Contractor
Grading	New Smyrna	$70,000	Hall Constrn. Co., Bainbridge, Ga.
Track work	New Smyrna	64,500	F. X. Bradley Co., St. Augustine.
Grading	Lake Worth	12,000	Duo Sand Co., West Palm Beach.
Track work	Lake Worth	18,300	B. F. Johnson Co., Baltimore.

GULF COAST LINES.—Bids have been received for the construction of a one-story brick and concrete passenger station at Brownsville, Tex., to cost $40,000.

PENNSYLVANIA.—This company has awarded a contract to the T. J. Foley Construction Company, Pittsburgh, for the construction of additional yard facilities at Massillon, O., to cost approximately $200,000.

PENNSYLVANIA.—This company plans to enlarge its Pavonia yard at Camden, N. J., by increasing the eastward yard capacity from 345 to 526 cars and the westward yard capacity from 263 to 436 cars. A westward receiving track, with a capacity of 85 cars, also will be provided as well as a track from which industries on the south side of the yard can be served.

PENNSYLVANIA.—This company has awarded a contract to the Keystone State Corporation, Philadelphia, for reconstructing its Thirty-second street tunnel, West Philadelphia, at an estimated cost of $740,000. The work is in connection with the electrification of the railroad between West Philadelphia, West Chester and Wilmington. The new tunnel section will be 18 ft. 6 in. by 31 ft.

RICHMOND, FREDERICKSBURG & POTOMAC.—This company has authorized the extension of the Potomac transfer facilities, including additional trackage facilities and an island platform at Potomac Yard, Va., at an estimated cost of $48,000. The work will be done by company forces.

ST. LOUIS-SAN FRANCISCO.—This company, in its application to the Interstate Commerce Commission for a certificate for the construction of a line from Aberdeen, Miss., to Kimbrough, Ala., 152 miles, to connect with its recently acquired Muscle Shoals, Birmingham & Pensacola line, stated that at a later time, when conditions justify it, it will file an application to build a branch from a point on its line near Bessemer, Ala., to the proposed extension at or near Magnolia, Ala. Location surveys for the connecting line between the St. Louis-San Francisco at Aberdeen, Miss., and the Muscle Shoals, Birmingham & Pensacola at Kimbrough, Ala., have been completed. It is understood that the construction of this line, which will be 152 miles long, will be undertaken late this year. Bids for the construction of reinforced concrete culverts and pipe culverts on line of the Muscle Shoals, Birmingham & Pensacola between Kimbrough and Pensacola, will be received until May 17. This work is estimated to cost $25,000.

SAN ANTONIO & ARANSAS PASS.—Oral arguments were heard by the Interstate Commerce Commission on May 7 on the application for a certificate for the construction of two lines in Texas, from Edinburg to Harlingen, 30 miles, and from Falfurrias to the Mexican border, 90 miles. A proposed report by Commissioner Woodlock had recommended against granting the application, which is opposed by the Missouri Pacific.

SOUTHERN PACIFIC.—An appropriation of $450,000 has been made for the construction of a roundhouse, car repair shed, office building and track facilities at Eugene, Ore.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.—A contract has been awarded to G. E. Neff, Ferguson, Mo., for the construction of a 55 ft. by 100 ft., one-story brick and concrete warehouse at St. Louis, Mo., to cost $25,000.

UNION PACIFIC.—The Interstate Commerce Commission has authorized this company to construct an 8-mile branch near Lyman, Nebr., and a 10-mile branch near Gering, Nebr., estimated to cost respectively $236,619 and $272,553.

On the Madrid Saragossa & Alicante, Spain

Railway Financial News

ALABAMA GREAT SOUTHERN.—*New Director.*—Morton H. Fry of Scholle Brothers, New York, has been elected a director succeeding Robert Mallory, Jr., of Spencer, Trask & Co., resigned.

Extra Dividend.—Directors have declared an extra dividend of 5 per cent on the preferred and ordinary stocks in addition to regular semi-annual dividends of 3½ per cent on each issue. The preferred dividends are payable June 28 to stockholders of record May 24. The dividends on the ordinary stock are payable August 16 to stockholders of record July 12.

ATLANTA, BIRMINGHAM & ATLANTIC.—*Sale.*—Foreclosure and sale of the properties of the Atlanta, Birmingham & Atlantic railroad was ordered on May 13 by Judge Samuel H. Sibley in the federal court at Atlanta following a request on the part of stockholders that a special master be appointed to investigate the value of the road before its sale. Judge Sibley, in his decision on the matter said:

"I am satisfied that this road, however skillfully managed, can hardly sustain itself by its local traffic and cannot secure enough traffic to make it profitable, surrounded as it is by strong systems controlling their own business.

"This has been shown by the entire history of the road as well as by the experience of this last receivership. Nevertheless, in the hands of a strong system, furnishing its traffic to it, its profitableness could be greatly enhanced. The great activity of Florida and the prosperity of South Georgia have been reflected in better earnings of this railroad during the past year, and there has been brought forward a prospective customer. There are now about $300,000 of taxes, $3,000,000 of accumulating operating deficits and some $10,000,000 of mortgage indebtedness, however, all claiming and entitled to payment.

"I think the opportunity for a sale ought not to be jeopardized by delay at the suggestion of the stockholders only. The rights of creditors are above those of stockholders and the court cannot refuse satisfaction to creditors because stockholders are threatened with loss."

Foreclosure and sale has been set for June 16, and it is expected that the Atlanta, Birmingham & Atlantic will be absorbed by the Atlantic Coast Line in conformance with plans previously announced.

APALACHICOLA NORTHERN.—*Bonds Extended.*—The Interstate Commerce Commission has granted authority for the extension for five years from September 15, 1925, of the maturity date of $2,000,000 first mortgage bonds. These bonds represent the company's entire funded debt. They are all held by the St. Joe Bay Company first mortgage bondholders' protective committee for the benefit of St. Joe Bay Company first mortgage bondholders. This committee was organized in 1914 and bought the bonds at a foreclosure sale, the bonds having been pledged as collateral.

ATLANTIC COAST LINE.—*Acquisition Favored.*—The board of directors of the Chamber of Commerce of Charleston, S. C., has passed a resolution approving the purchase of the Columbia, Newberry & Laurens by the Atlantic Coast Line. The resolution says in part:

"It appears that this is the remaining link whereby the Coast Line may be connected up directly with the Clinchfield Railroad now owned by the Atlantic Coast Line and the Louisville and Nashville, the Southern terminus of which road is at Spartanburg, and that with the railroads now owned by the Coast Line from Laurens to Spartanburg and from Charleston to Columbia, this one remaining link, Columbia, Newberry and Laurens, will afford the Coast Line a direct outlet from the terminus of the Clinchfield into the port of Charleston. It further appears that through the acquisition, control and management of this short line the Atlantic Coast Line will thus have out of Charleston a direct unbroken and continuous line into the Piedmont of South Carolina from this city."

CHICAGO & ALTON.—1925 *Earnings.*—Annual report for 1925 shows a net income after interest and other charges of $41,283. In 1924 there was a deficit of $1,035,242. Selected items from the income statement follow:

CHICAGO & ALTON

	1925	1924	Increase or Decrease
Railway Operating Revenues	31,077,084	30,854,030	223,054
Maintenance of way	3,809,003	4,169,311	—360,308
Maintenance of equipment	6,917,487	7,011,157	—93,670
Transportation	11,209,191	11,325,216	—116,025
Total Operating Expenses	23,426,972	23,893,469	—466,497
Operating ratio	75.38	77.44	1.94
Net Revenue from Operations	7,650,112	6,960,561	689,551
Railway tax accruals	1,282,761	1,243,085	39,677

Railway operating income	6,367,351	5,717,476	649,875
Equipment rents ....Dr. Bal.	979,444	905,519	73,924
Joint facility rents....Dr. Bal.	831,780	412,342	419,437
Net Railway Operating Income	4,642,451	3,645,776	996,675
Non-operating income	92,718	86,713	6,005
Gross Income	4,735,169	3,732,489	1,002,680
Interest on funded debt	3,597,242	3,629,522	—32,280
Total Deductions from Gross Income	4,693,885	4,767,731	—73,846
Net Income	41,283	(Def.) 1,035,242	1,076,526

CHICAGO, BURLINGTON & QUINCY.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon a line between Guernsey and Ironton, Wyo., 10 miles, and a branch between Chalco and Utan, Neb., 8 miles.

1925 Operations.—See article on another page of this issue entitled "The Contrast in Burlington."

CHICAGO, MILWAUKEE & ST. PAUL.—*Investigation.*—Hearings in connection with the Interstate Commerce Commission's investigation will be resumed on May 25 at Chicago before Commissioner Cox and Examiner Bardwell.

CHICAGO, ROCK ISLAND & PACIFIC.—*New Chairman.*—E. N. Brown, chairman of the board of the St. Louis-San Francisco, has been elected also chairman of the executive committee of the Chicago, Rock Island & Pacific. Charles Hayden, whom he succeeds, will remain ex-officio a member of the committee. This change is in connection with the recent acquisition by the Frisco of a substantial interest in Rock Island.

CHICAGO, ROCK ISLAND & PACIFIC.—*Notes.*—The Interstate Commerce Commission has authorized an issue of $6,000,000 of two-year 4½ per cent secured notes, to be sold at not less than 98.32, the proceeds to be used for retiring a like amount of outstanding notes. The commission also authorized the pledge of $8,700,000 of first and refunding mortgage 4 per cent gold bonds as security, and such additional amount of bonds as may be necessary to maintain the value of the securities pledged equal at all times to not less than 120 per cent of the face value of the notes outstanding.

ELGIN, JOLIET & EASTERN.—1925 *Earnings.*—Annual report for 1925 shows net income after fixed charges of $1,311,527 as compared with $538,483 in 1924. Selected items from the income statement follow:

ELGIN, JOLIET & EASTERN

	1925	1924	Increase or Decrease
Average mileage operated	459.79	459.77	.02
Railway Operating Revenues	25,006,966	21,521,787	3,485,179
Maintenance of way	2,304,241	2,184,640	119.601
Maintenance of equipment	5,902,739	4,737,653	1,165,086
Transportation	8,492,716	7,706,208	786,508
Total Operating Expenses	17,411,663	15,287,842	2,123,821
Operating ratio	69.63	71.03	—1.40
Net Revenue from Operations	7,595,303	6,233,945	1,361,358
Railway tax accruals	1,343,534	1,087,373	256,161
Railway operating income	6,247,986	5,136,917	1,111,069
Equip. and joint facility rents..Net Dr.	2,230,143	1,825,496	404,647
Net Railway Operating Income	4,017,843	3,311,421	706,421
Non-operating income	336,340	324,089	12,251
Gross Income	4,354,182	3,635,510	718,672
Rent for leased roads	2,322,791	2,915,887	—593,096
Interest on funded debt	500,000	500,000	.....
Total Deductions from Gross Income	3,042,655	3,097,027	—54,372
Net Income	1,311,527	538,483	773,044

ILLINOIS CENTRAL.—*Equipment Trust.*—The Interstate Commerce Commission has authorized an issue of $5,018,000 of 4½ per cent equipment trust certificates, to be sold at not less than 97.2.

ILLINOIS CENTRAL.—*Acquisition of Vicksburg Lines Approved.*—The Interstate Commerce Commission on May 19 made public its decision authorizing the acquisition by the Yazoo & Mississippi Valley of control of the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific, subject to conditions regarding the maintenance of through routes, and also approving the guaranty by the Illinois Central of the performance by the lessee of the provisions and covenants of the leases. Chairman Eastman and Commissioner McManamy dissented on the ground that the acquisition would amount to a consolidation, while Chairman Eastman stated as an additional reason that the rental proposed in the case of the Alabama & Vicksburg is too high. Commissioner Woodlock also dissented but wrote no separate opinion. The majority report says:

> We recognize the force of many of protestants' contentions, particularly as to the power which the proposed acquisition, if granted without conditions, would give the applicants to divert traffic to their lines from other railroads to the injury of those other roads, and, perhaps, in some cases to the detriment of the communities which they serve; but the facts shown by the record and the arguments drawn therefrom convince us that the granting of the application will be in the public interest. The acquisition of control sought seems to be a natural step in the direction of the ultimate consolidation of the railway properties of the country into a limited number of systems, as contemplated by the interstate commerce act in paragraph (4) of section 5. The A. & V. and V. S. & P. have been successfully operated as one line for more than forty years and it seems advisable to keep them together in operation. If they are to be kept together, and allotted to, or combined with, any large railroad system, the Illinois Central from its location is the natural system to take them.
>
> The acquisition of control sought will be approved upon the following terms and conditions:
>
> (1) So far as lies within their power, and unless and until otherwise ordered by us, the applicants shall preserve existing routes and channels of trade and commerce heretofore established by other carriers in connection with the Vicksburg Route or by the Vicksburg Route in connection with other carriers, maintain existing gateways for the interchange of traffic with such other carriers and continue the present neutrality of handling traffic by the Vicksburg Route, so as to permit equal opportunity for service and routing or movement of traffic which is competitive with traffic of the applicants, or either of them, to and from all lines connecting with the Vicksburg Route, so long as the carriers operating those lines desire the maintenance of such existing routes, without discrimination in service against such competitive traffic.
>
> (2) Applicants shall permit the line of the Vicksburg Route to be used as a link for through traffic, via existing gateways of interchange, or via such gateways as hereafter may be established under our authority, available to such other carriers now or hereafter connecting with the line of the Vicksburg Route as may desire to participate in through routes and joint rates between points on their lines and points on the lines of any other carriers connecting with the Vicksburg Route, and to and from points on the Vicksburg Route and from and to points on the lines of other carriers.

LEHIGH & NEW ENGLAND.—1925 *Earnings.*—Annual report for 1925 shows net income after interest and other charges of $683,647, equivalent to $5.02 per share on the $50 par value capital stock. Net income in 1924 was $859,980, equivalent to $6.32 per share. Selected items from the income statement follow.

LEHIGH & NEW ENGLAND

	1925	1924	Increase or Decrease
Average mileage operated	219.45	219.45	.....
Railway operating revenues	$5,295,382	$5,413,879	—$118,496
Maintenance of way	$739,249	$709,691	$29,557
Maintenance of equipment	1,318,201	1,442,653	—124,453
Transportation	1,733,080	1,689,837	43,243
Total operating expenses	$4,071,152	$4,138,723	—$67,571
Operating ratio	76.88	76.45	.43
Net revenue from operations	$1,224,230	$1,275,155	—$50,925
Railway tax accruals	169,597	204,842	—35,245
Railway operating income	$1,054,504	$1,069,546	—$15,043
Net Railway operating income	Not shown		
Non-operating income	162,191	253,698	—91,507
Gross income	$1,216,695	$1,323,244	—$106,550
Interest on funded debt	344,150	317,303	26,847
Total deductions from gross income	$533,048	$463,264	$69,784
Net income	$683,647	$859,980	—$176,333

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—1925 *Earnings.*—Annual report for 1925 shows net income after interest and other charges of $2,072,590 equivalent after allowance for 7 per cent preferred dividends to $4.72 a share on the common stock. Net income in 1924 was $20,825 or 16 cents a share on the preferred stock. See excerpts from annual report on an adjoining page.

NORTHERN CENTRAL.—*Bonds.*—The Interstate Commerce Commission has authorized an issue of $5,231,000 of general and refunding mortgage 5 per cent bonds, to be delivered at par to the Pennsylvania for advances, and to be guaranteed by it as lessee.

PORT ST. JOE DOCK & TERMINAL COMPANY.—*Bonds Extended.*—The Interstate Commerce Commission has approved extension for five years from September 15, 1925, of the maturity dates of $250,000 first mortgage bonds and $1,000,000 refunding 5 per cent bonds. All of these bonds are held by the St. Joe Bay Company first mortgage bondholders protective committee organized in 1914 to protect the rights of these bondholders and which bought the bonds at a foreclosure sale, the bonds having been pledged as collateral security.

RUTLAND.—1925 *Earnings.*—Annual report for 1925 shows net income after interest and other charges of $371,913 equivalent to

(*Continued on page* 1420)

Annual Reports

Colorado & Southern Ry. Co.—Twenty-Seventh Annual Report

Chicago, January 2, 1926.

TO THE STOCKHOLDERS OF THE COLORADO AND SOUTHERN RAILWAY COMPANY:

Herewith is submitted the Twenty-Seventh Annual Report of your Board of Directors for the year ended December 31, 1925, setting forth composite income statement and statistics of operation for Colorado and Southern Lines included in this report. Balance sheets, income account and other statements of the several companies comprising the Colorado and Southern Lines are shown separately in the report of the Comptroller.

Comparative Statement of Income, Years Ended December 31

Percent of Ry. oper. Revenue	1925		1924	Percent of Ry. Oper. Rev.
		RAILWAY OPERATING REVENUES		
76.40	$19,598,517.62	Freight	$19,694,843.42	75.90
16.14	4,140,562.10	Passenger	4,415,840.05	17.02
1.59	408,040.43	Mail	404,527.87	1.56
1.99	510,614.49	Express	474,000.55	1.83
2.26	579,358.62	All other transportation	625,781.98	2.41
1.35	347,178.90	Incidental	297,183.38	1.14
.27	69,882.59	Joint facility	34,553.54	.14
100.00	$25,654,154.75	Total railway operating revenues	$25,946,730.79	100.00
		RAILWAY OPERATING EXPENSES		
11.26	$2,888,666.33	Maintenance of way and structures	$2,844,059.39	10.96
19.23	4,934,682.89	Maintenance of equipment	5,015,677.61	19.33
1.36	348,603.41	Traffic	337,844.24	1.30
32.98	8,461,550.13	Transportation	8,478,912.80	32.69
.79	203,688.94	Miscellaneous operations	166,692.02	.64
3.74	958,266.44	General	955,001.39	3.68
.17 Cr.	44,829.91	Transportation for investment—Cr.	28,018.36	Cr..11
69.19	$17,750,628.23	Total railway operating expenses	$17,770,169.09	68.49
30.81	$7,903,526.52	Net revenue from railway operations	$8,176,561.70	31.51
.....	$1,637,702.52	Railway tax accruals	$1,512,347.14	.....
.....	6,992.52	Uncollectible railway revenue	9,828.48	.....
.....	$6,258,831.48	Railway operating income	$6,654,386.08	.....
		NON-OPERATING INCOME		
.....	$378,163.82	Hire of equipment	$281,456.02	.....
.....	98,192.69	Joint facility rent income	61,014.39	.....
.....	95,260.94	Miscellaneous rent income	89,091.25	.....
.....	596,011.96	Dividends and miscellaneous interest	617,954.26	.....
.....	2,945.87	Miscellaneous income	1,708.92	.....
.....	$1,170,575.28	Total non-operating income	$1,051,224.84	.....
.....	$7,439,406.76	Gross Income	$7,705,610.92	.....
		DEDUCTIONS FROM GROSS INCOME		
.....	$909,588.67	Hire of equipment	$668,198.77	.....
.....	164,116.24	Joint facility rents	107,894.26	.....
.....	7,121.02	Miscellaneous rents	21,072.44	.....
.....	2,551,365.45	Interest on funded debt	2,698,054.61	.....
.....	7,859.66	Interest on unfunded debt	9,365.19	.....
.....	32,157.44	Amortization of discount on funded debt	32,926.00	.....
.....	91,259.22	Miscellaneous income charges	112,128.61	.....
.....	$3,763,467.70	Total deductions from gross income	$3,649,639.88	.....
.....	$5,661,483.08	Net railway operating income	$6,220,763.46	.....
.....	$3,665,939.06	Net income	$4,055,071.04	.....
		DISPOSITION OF NET INCOME		
.....	$680,311.04	Dividends	$680,311.04	.....
.....	$680,311.04	Total appropriations of income	$680,311.04	.....
.....	$2,985,628.02	Income balance	$3,375,660.00	.....

General Operations

Revenues:

Total Operating Revenues for 1925	$25,654,154.75	
Total Operating Revenues for 1924	25,946,730.79	
Decrease	$292,576.04—	1.13%

This decrease is made up as follows:

Freight	Decreased	$96,325.80—	.49%
Passenger	Decreased	275,277.96—	6.23%
Mail	Increased	3,512.56—	.87%
Express	Increased	36,613.94—	7.72%
Switching	Increased	31,518.16—	7.70%
Other Transportation Revenues	Decreased	77,941.52—	35.98%
Incidental Operating Revenues	Increased	85,324.57—	25.72%
Net decrease		$292,576.04—	1.13%

A comparison of tonnage by commodities with 1924 shows a net increase as follows:

Products of agriculture	Decreased	278,735 tons—	18.78%
Animals and products	Increased	2,866 tons—	1.04%
Products of mines	Increased	210,245 tons—	5.66%
Products of forests	Increased	14,765 tons—	3.89%
Manufacturers and miscellaneous	Increased	132,754 tons—	6.53%
Less carloads	Increased	1,967 tons—	1.30%
Total tonnage	Increased	83,862 tons—	1.04%

A comparison of carloads shows:

Total cars (all commodities) in 1925	261,010 cars	
Total cars (all commodities) in 1924	258,883 cars	
Increase in 1925	2,127 cars—	.82%

While there was a slight decrease in total freight revenue, the tonnage shows a slight gain. The most serious decrease was in the movement of grain, the cars of wheat hauled being less than half the number handled in 1924 and the carloads of all grains being 25% less than in the previous year. This was partially offset by increases in the cars of cotton and of cotton seed and its products.

The increase in the Products of Mines was due to increases of 38% in cars of ore and 28% in cars of crude petroleum handled.

The increase in Manufactures and Miscellaneous was due to heavier movement of manufactured iron and steel, building materials and agricultural implements.

The decrease in Passenger revenue was due to decreases of 16% in the number of passengers carried and 5.5% in the number of passengers carried one mile. This was due principally to the light movement of laborers to the beet and cotton fields and to the effect on short haul traffic of competition of bus companies and the use of private automobiles. Though there was some falling off in the average revenue per mile of passengers carried, the average earnings per passenger showed an increase of 11.8%, resulting from an increase of 4.7% in the distance traveled per passenger, due largely to greater tourist movement over the lines from the south.

Operating Statistics:

Tons of revenue freight carried—1925	8,122,796		
Tons of revenue freight carried—1924	8,038,934		
Increase	83,862—	1.04%	
Revenue tons one mile—1925	1,426,517,730		
Revenue tons one mile—1924	1,391,213,113		
Increase	35,304,617—	2.54%	
Revenue tons per train mile—1925	532.03		
Revenue tons per train mile—1924	518.68		
Increase	13.35—	2.57%	
Revenue tons per loaded car—1925	24.29		
Revenue tons per loaded car—1924	24.38		
Decrease	.09—	.37%	
Revenue passengers carried—1925	977,005		
Revenue passengers carried—1924	1,165,019		
Decrease	188,014—	16.14%	
Revenue passengers carried one mile—1925	122,321,143		
Revenue passengers carried one mile—1924	129,486,972		
Decrease	7,165,829—	5.53%	
Average distance carried—revenue passengers—1925	116.37		
Average distance carried—revenue passengers—1924	111.15		
Increase	5.22—	4.70%	

Expenditures (Operating):

Total operating expenses—1925	$17,750,628.23		
Total operating expenses—1924	17,770,169.09		
Decrease	$19,540.86—	.11%	

Total operating expenses were practically the same as in the previous year. Maintenance of way and structures expenses, also miscellaneous operations, showed increases, but these were offset by a decrease in maintenance of equipment and transportation expenses.

The operating ratio was 69.19% compared with 68.49% in 1924, and 78.37% in 1923.

By order of the Board of Directors.

HALE HOLDEN, President.

Annual Report of the Minneapolis, St. Paul & Sault Ste. Marie Railway Co.

Wisconsin Central Railway Company

Annual Report for the Fiscal Year Ended December 31, 1925

To the Stockholders:

Submitted herewith is a report for the fiscal year ended December 31, 1925.

The Gross Earnings, Operating Expenses, Fixed Charges, Surplus, etc., are shown in the following condensed statement:

	Soo Line	Wis. Cent. Ry.	System 1925	System 1924
Gross Earnings	$29,264,749.13	$20,405,515.18	$49,670,264.31	$47,945,359.53
Operating Expenses	20,693,107.85	15,382,428.67	36,075,536.52	36,813,854.63
Net Earnings	$8,571,641.28	$5,023,086.51	$13,594,727.79	$11,131,504.90
Income from Other Sources	895,502.21	325,304.34	1,220,806.55	1,127,018.07
Total Income	$9,467,143.49	$5,348,390.85	$14,815,534.34	$12,258,522.97
Fixed Charges, Taxes, etc.	7,703,032.58	5,039,911.09	12,742,943.67	12,237,697.48
Addition to Surplus	$1,764,110.91	$308,479.76	$2,072,590.67	$20,825.49

Freight Revenue for the System during 1925 was $39,419,822.34, an increase of $2,070,717.58 or 5.54%, compared with the previous year. The 1924 grain crop amounted to 64,943,053 bushels, of which 70.5% moved during the year 1924. It is estimated that the 1925 grain crop amounted to 58,619,454 bushels, of which only 65.5% was moved during the year 1925. This resulted in a decrease of $440,000.00 in revenue as compared with the previous year. There were increases in revenue from shipments of the following commodites: Iron ore $421,000.00, stone, sand and gravel $118,000.00, farm implements and automobiles $453,000.00, L. C. L. freight $431,000.00, miscellaneous carloads $780,000.00. These, together with other smaller increases, resulted in a total net increase in freight revenue of $2,071,000.00.

Passenger Revenue was $6,292,051.69, a decrease of $283,854.37, or 4.3%, compared with the previous year. The decrease in local ticket sales was $263,711.00, which accounts for practically all of the decrease in passenger earnings. Train service was curtailed everywhere possible, in line with the decrease in local travel, resulting in a decrease of 4% in passenger train miles. Long distance and tourist travel showed a continued improvement; the through service via the Canadian Rockies becoming more popular each year.

Milk Revenue was $632,132.94, a decrease of $41,375.41, or 6.14%, compared with the previous year. Increased diversification of farming west of Minneapolis was indicated by an increase in milk revenue of $30,641.59 in Soo Line territory proper. This increase, however, was more than offset by the decrease in milk revenue on the Wisconsin Central, amounting to $72,017.00, due to the fact that most of the short haul milk is now being handled by trucks.

Maintenance of Way and Structures Expenses decreased $450,971.95 compared with the previous year. There was an unusual amount of ballasting and bridge filling work done during the year 1924.

Maintenance of Equipment Expenses increased $219,770.18, or 2.54%, compared with the previous year. This was entirely due to a change in accounting required by Interstate Commerce Commission rules. Effective August 1, 1925, certain costs of rebuilding cars were charged to this account, instead of to Additions and Betterments.

Transportation Expenses decreased $593,485.98, or 3.1%. Freight revenue increased 5.5%; gross ton miles (which includes weight of cars as well as freight) increased 2.9%. Decrease in transportation expenses was accomplished by an increase in train tonnage from 1,253 tons in 1924 to 1,295 tons in 1925. This reduced freight train miles .4% in the face of increased business. A decrease in the amount of coal burned per unit of business moved resulted in a saving of $157,788.45. Ratio of transportation expenses to revenue was 37.00, compared with 39.56 in 1924. This was the lowest ratio since 1916.

There was an increase of $153,762.10 in payments for "Hire of Equipment," as compared with 1924, caused by the increased business handled.

The outstanding indebtedness was increased during the year as follows:

Minneapolis, St. Paul & Sault Ste. Marie Railway Company:	
First Consolidated Mortgage 5% Bonds	$8,136,000.00
Series "L" Equipment Notes	400,000.00
Twenty-five Year Gold Notes, issued in exchange for Wisconsin Central Railway Company Common Stock	20,600.00
Total Increase	$8,556,600.00

Decrease of outstanding indebtedness was effected or provided for during the year as follows:

Minneapolis, St. Paul & Sault Ste. Marie Railway Company:		
M. S. S. M. & A. Ry. Co. First Mortgage Bonds	$250,000.00	
Funds deposited with Trustee for retirement on January 1, 1926, of M. S. S. M. & A. Ry. Co. First Mortgage Bonds	7,886,000.00	
First Refunding Mortgage Bonds, Series "A"	35,000.00	
Equipment Trust Obligations	549,266.46	
Two-Year 5% Gold Notes	45,000.00	
Wisconsin Central Railway Company:		
First General Mortgage Bonds	141,000.00	
Marshfield & Southeastern Division P. M. Bonds	6,000.00	
Equipment Trust Obligations	156,733.54	
Total Decrease		$9,069,000.00
Net Decrease		$512,400.00

There were outstanding $8,136,000 Minneapolis, Sault Ste. Marie & Atlantic Railway Company First Mortgage bonds maturing on January 1st, 1926. For the purpose of retiring these the Minneapolis, St. Paul & Sault Ste. Marie Railway Company issued a like amount of bonds under its First Consolidated Mortgage. These were sold as 5 per cent bonds with interest guaranteed by the Canadian Pacific Company. The proceeds, together with the necessary additional amount of cash, were deposited with the Trustee to be used in retiring the bonds maturing on January 1st, 1926.

There were issued $400,000.00 Series "L" Equipment Notes in the acquirement of 250 steel body and underframe ore cars.

During the year, there was expended for Additions and Betterments to Road a net amount of $1,083,556.25. There was also expended for Additions and Betterments to Equipment (including 250 new ore cars acquired under provisions of Series "L" Equipment Notes) $1,171,383.08. Equipment valued at $831,616.80 was retired. This made a net increase in Additions and Betterments to Equipment of $339,766.28. The Company has purchased 500 box cars, 100 gondola cars and 2 Cafe Parlor cars for delivery during 1926.

There has been no important change in the situation affecting the Interstate Commerce Commission tentative valuation of the property and assets of the Minneapolis, St. Paul and Saint Ste. Marie Railway Company, Wisconsin Central Railway Company and the Central Terminal Railway Company, except that the Interstate Commerce Commission hearing of the protest of these Companies began on May 3rd and is now going on. The aggregate cost of these Companies of the valuation work up to December 31st, 1925, amounted to $453,935.56.

Subsequent to Federal Control, this Company, as Trustee, handled certain accounts for the United States Railroad Administration. During the year, final settlement of these accounts was made. There are now no unadjusted items between this Company and the United States Railroad Administration.

The foregoing figures indicate that the results obtained for 1925 were a great improvement over 1924.

Conditions in the agricultural communities of the Northwest are improving rapidly. Farmers have been able to pay up past due interest, taxes, and current debts; diversification is growing as fast as is wise; and the buying power of the farmer is increasing; so we can look forward with confidence to the future. An average crop during 1926 at prices near what they are today will surely put the Northwest in a good condition. This will further stimulate the growing interest in farm lands, which is now developing, and will mean that emigration from the older farming sections of this country will again turn toward the Northwest. The importance of this cannot be overestimated, for to bring back again into production the farms which were abandoned during the farm crisis of the years 1920 to 1924 will be the greatest factor in enabling our property to again show satisfactory results.

During 1925 our property was well maintained and many improvements were made which will effect economies in operation.

Various statements covering the operations of the property during the period January 1 to December 31, 1925, will be found on the following pages.

Respectfully submitted,

C. T. JAFFRAY, *President.*

May 5, 1926.

Railway Financial News

(*Continued from page* 1417)

$4.15 a share on the preferred stock. Net income in 1924 was $407,309 or $4.18 a share on the preferred. Selected items from the income statement follow.

RUTLAND

	1925	1924	Increase or Decrease
Average mileage operated	413.01	413.01	.....
Railway operating revenues	$6,440,041	$6,509,063	—$69,021
Maintenance of way	$1,227,292	$1,261,700	—$34,407
Maintenance of equipment	1,299,649	1,225,396	74,252
Transportation	2,618,912	2,700,615	—81,703
Total operating expenses	$5,449,501	$5,476,007	—$26,507
Operating ratio	84.62	84.13	0.49
Net revenue from operations	$990,541	$1,033,055	—$42,515
Railway tax accruals	310,321	297,307	13,014
Railway operating income	$679,905	$735,324	—$55,419
Equipment rents .....Net Cr.	51,963	12,466	39,497
Joint facility rents.....Net Cr.	54,795	51,818	2,978
Net railway operating income	$786,663	$799,608	—$12,944
Non-operating income	73,645	79,087	—5,442
Gross income	$860,308	$878,695	—$18,386
Rent for leased roads	19,000	19,000	.....
Interest on funded debt	463,739	447,175	16,564
Total deductions from gross income.	$488,396	$471,385	$17,010
Net income	$371,913	$407,309	—$35,396

ST. LOUIS SOUTHWESTERN.—1925 *Earnings.*—Annual report for 1925 shows net income of $2,379,292 equivalent after 5 per cent preferred dividends to $8.46 a share on the common stock. Net income in 1924 was $2,365,162 or $8.37 a share. Selected items from the income statement follow.

ST. LOUIS SOUTHWESTERN

	1925	1924	Increase or Decrease
Average mileage operated	1,750.22	1,777.01	—26.79
Railway operating revenues	$26,132,262	$26,326,291	—$194,029
Maintenance of way	$4,626,890	$4,232,984	$393,907
Maintenance of equipment	5,504,331	5,878,093	—373,762
Transportation	7,536,033	7,770,502	—234,469
Total operating expenses	$19,925,859	$20,027,914	—$102,056
Operating ratio	76.25	76.08	.17
Net revenue from operations	$6,206,404	$6,298,377	—$91,973
Railway tax accruals	1,171,512	1,286,014	—114,502
Railway operating income	$5,029,359	$5,007,402	21,957
Hire of freight cars....Cr. Bal	162,264	184,619	—22,355
Joint facility rents.....Dr. Bal	368,550	445,634	—77,084
Net railway operating income	$4,817,854	$4,741,012	76,843
Non-operating income	271,176	317,936	—46,760
Gross income	$5,089,030	$5,058,948	$30,083
Interest on funded debt	2,667,974	2,649,714	18,260
Total deductions from gross income.	$2,709,738	$2,693,786	15,953
Net income	$2,379,292	$2,365,162	14,130
Disposition of net income:			
Applied to sinking funds	32,099	7,800	24,299
Appropriated for investment in physical property	.....	334,000	—334,000
Appropriated for annuity trusts	.....	18,043	—18,043
Surplus for year carried to profit and loss	$2,347,193	$2,005,319	$341,874

SEABOARD AIR LINE.—1925 *Earnings.*—Preliminary annual report for 1925 shows net income after fixed charges and interest on adjustment bonds of $2,584,975 equivalent after allowance for dividends on the 4 per cent and 6 per cent preferred stock to $4.39 a share on the outstanding common stock. Net income in 1924 was $1,828,943 or $2.35 a share on the common. Selected items from the income statement follow.

SEABOARD AIR LINE

	1925	1924	Increase or Decrease
Railway operating revenues	$62,864,711	$53,384,173	$9,480,538
Total operating expenses	$46,733,364	$41,387,634	$5,345,730
Net revenue from operations	$16,131,347	$11,996 539	$4,134,808
Railway tax accruals	3,023,401	2,442,535	580,865
Railway operating income	$13,085,363	$9,536,196	$3,549,167
Equipment rents .....Dr.	2,148,605	412,865	735,740
Joint facility rents.....Dr.	114.027	109,817	4,210
Net railway operating income	$10,822,731	$9,013,514	$1,809,216
Non-operating income	1,100,397	1,035,318	65,079
Gross income	$11,923,128	$10,048,833	$1,874,295
Interest on funded debt	8,000.385	7,851,413	248,973
Net income	$2,584,976	$1,828,943	$756,032

SOUTHERN.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire and operate a branch line from Parrish, Ala., to High Level, 6.4 miles, part of the line formerly operated by the Ensley Southern.

SOUTHERN PACIFIC.—*Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority for an issue of $5,654,000 of 4½ per cent equipment trust certificates, to be used in the purchase of equipment to the amount of $8,715,000, and to be sold to Kuhn, Loeb & Co., at 97.

ST. LOUIS-SAN FRANCISCO.—*New Director.*—Henry Ruhlender has been elected a director succeeding Frank C. Wright, resigned.

TOLEDO, PEORIA & WESTERN.—*Sale.*—A decree authorizing Special Master Edward P. Allen to advertise for bids for the Toledo, Peoria & Western was authorized by Federal Judge Louis Fitzhenry at Springfield, Ill., on April 30. The road will be advertised both in its entirety and in 13 parcels on which separate bids will be received. The sale will probably be held at Peoria, Ill., between June 1 and 10. A price of $1,000,000 was set on the property by the court. Unless bids exceed that amount the sale will not be permitted.

TOLEDO, PEORIA & WESTERN.—1925 *Earnings.*—Annual report for 1925 shows a deficit after charges of $415,652. There was a deficit in 1924 of $359,311. Selected items from the income statement follow:

TOLEDO, PEORIA & WESTERN

	1925	1924	Increase or decrease
Average mileage operated	247.70	247.70	.....
Railway operating revenues	$1,617,067	$1,908,795	—$291,729
Total operating expenses	$1,682,798	$1,754,750	—$71,953
Net revenue from operations	Df. $65,731	$154,045	—$219,776
Railway tax accruals	90,000	102,000	—12,000
Railway operating income	Df. $55,789	$51,735	—$207,524
Net railway operating income	Not shown		
Non-operating income	$69,825	Dr. $38,770	$108,595
Gross income	Df. $85,964	$12,965	—$98,929
Total deductions from gross income..	$329,688	$372,276	—$42,587
Net income—deficit	$415,652	$359,311	$56,342

ULSTER & DELAWARE.—1925 *Earnings.*—Annual report for 1925 shows a deficit after interest and other charges of $94,982. In 1924 the company earned a net income of $11,125. Selected items from the income statement follow.

ULSTER & DELAWARE

	1925	1924
Railway operating revenues	$1,331,587	$1,504,984
Railway operating expenses	1,158,037	1,231,687
Net revenue from railway operations	$173,550	$273,297
Railway tax accruals	69,100	62,002
Total operating income	$104,448	$211,135
Non-operating income	25,704	28,244
Gross income	$130,151	$239,379
Total deductions from gross income	225,133	228,254
Net income	(Def.) $94,982	$11,125

UNION RAILROAD, PITTSBURG.—*Deficit Status.*—This company has asked the Interstate Commerce Commission to re-open the proceeding under section 204 of the transportation act for the purpose of ascertaining the amount of its deficit for the period September 21, 1918, to February 29, 1920, during which it operated its own road after relinquishment by the federal government. The commission had held that the company had for that period a net railway operating income of $934,440, whereas the company states that it overlooked certain facts and claims reimbursement to the amount of $1,738,484.

UNION REFRIGERATOR TRANSIT COMPANY.—*Equipment Trust Certificates.*—Lee, Higginson & Co. have sold $950,000, series F, 5 per cent equipment trust certificates at prices to yield from 4.75 to 5.05 per cent. The certificates mature in equal amounts semi-annually on May 15 and November 15, to May 15, 1936. The equipment includes 475 steel underframe refrigerator cars having a total value in excess of $1,270,000.

VIRGINIA BLUE RIDGE.—*Loan.*—This company has applied to the Interstate Commerce Commission for an extension for ten years of the government loan of $106,000 made to it under section 210 of the transportation act, which fell due on April 4, on the

ground that "its expected traffic has not yet developed as expected, for reasons beyond its control, though the expectation still remains and is merely deferred."

WARRIOR RIVER TERMINAL COMPANY.—*Stock.*—This company has applied to the Interstate Commerce Commission for authority to issue $89,000 of common stock, the proceeds to be used in connection with the purchase of part of the line of the Ensley Southern.

WARRIOR RIVER TERMINAL.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to purchase for $500,000 portions of the property of the Ensley Southern, including a line from Ensley Junction, Ala., to Birmingport, 18.5 miles.

WESTERN PACIFIC RAILROAD CORPORATION.—1925 *Earnings.*—Annual report of the Western Pacific Railroad Corporation, which is the holding company of the Western Pacific Railroad Company and the affiliated properties of that system, for 1925 shows net income of $4,898,664, equivalent after preferred dividends to $4.27 a share on the common stock.

WHEELING & LAKE ERIE.—1925 *Earnings.*—Annual report for 1925 shows net income after interest and other charges of $3,286,279 as compared with $1,282,744 in 1924. Selected items from the income statement follow:

WHEELING & LAKE ERIE

	1925	1924
Average mileage operated	511.60	511.60
Railway operating revenues	$20,395,619	$18,332,401
Maintenance of way	$2,680,816	$2,506,052
Maintenance of equipment	4,678,490	4,794,990
Transportation	6,040,044	6,282,382
Total operating expenses	$14,400,990	$14,410,273
Operating ratio	70.61	78.61
Net revenue from operations	$5,994,629	$3,922,129
Railway tax accruals	1,568,458	1,255,606
Railway operating income	$4,422,062	$2,661,791
Non-operating income	$349,156	$301,781
Gross income	$4,771,219	$2,963,571
Interest on funded debt	1,278,881	1,254,247
Total deductions from gross income	$1,484,940	$1,680,828
Net income	$3,286,279	$1,282,744

Average Price of Stocks and Bonds

	May 18	Last Week	Last Year
Average price of 20 representative railway stocks	88.95	88.83	80.75
Average price of 20 representative railway bonds	95.92	95.61	91.28

Dividends Declared

Alabama Great Southern.—Common, $1.75, semi-annually, common, extra, $2.50; both payable June 28 to holders of record May 24. Preferred, $1.75, semi-annually; preferred, extra, $2.50, both payable August 16 to holders of record July 12.

American Railway Express.—$1.50, quarterly, payable June 30 to holders of record June 15.

Boston & Albany.—2½ per cent, quarterly, payable June 30 to holders of record May 29.

Chestnut Hill.—1½ per cent, quarterly, payable June 4 to holders of record May 20.

Pittsburgh, Bessemer & Lake Erie.—Preferred, $1.50, payable June 1 to holders of record May 15.

Union Pacific.—Common, 2½ per cent, quarterly, payable July 1 to holders of record June 1.

Valuation Reports

The Interstate Commerce Commission has issued final or tentative valuation reports finding the final value for rate-making purposes of the property owned and used for common carrier purposes, as of the respective valuation dates, as follows:

FINAL REPORTS.

Alcolu	$258,000	1917
Atlantic Northern	237,000	1918
Bevier & Southern	217 550	1918
Florida, Alabama & Gulf	127,625	1917
Garyville Northern	256.220	1919
Jefferson & Northwestern	330.660	1918
Kanawha, Glen Jean & Eastern	651,500	1916
Macomb, Industry & Littleton	215,490	1918
Manila & Southwestern	45,000	1917
Rio Grande & Eagle Pass	608,875	1917
Sligo & Eastern	230,500	1917
Texas Short Line	196,836	1918
Union Depot, Columbus, O	1,575,000	1916
Virginia Blue Ridge	300,000	1917

Railway Officers

Executive

George F. Lindsay has been elected a vice-president of the Warren & Ouachita Valley, with headquarters at St. Paul, Minn. The other officers of the company were re-elected.

E. N. Brown, chairman of the board of the St. Louis-San Francisco, with headquarters at New York, has been elected chairman of the executive committee of the Chicago, Rock Island & Pacific, succeeding **Charles Hayden,** who remains a member of the committee ex officio. **F. H. Hammill,** executive vice-president of the Chicago, Rock Island & Pacific, with headquarters at New York, has resigned.

Financial, Legal and Accounting

J. H. Conley has been appointed auditor and local treasurer of the Georgia Southwestern & Gulf, with headquarters at Albany, Ga., succeeding **A. D. Daniel,** acting auditor and local treasurer, who has been assigned to other duties.

Operating

W. J. Spangle has been appointed assistant trainmaster of the Fort Wayne division of the Pennsylvania, with headquarters at Fort Wayne, Ind., succeeding **W. L. Whiter,** transferred.

C. L. Beals, who has been appointed assistant general manager of the Florida East Coast, was born on May 16, 1887, at Georgetown, Wis. He was educated in the public schools of Chicago and at business college, and entered the service of the Illinois Central on November 22, 1902, as a switch tender. He left that road in April, 1903, and from that time until December 5, 1905, he worked on several railroads as yard clerk, hostler, fireman and switchman. On the latter date he returned to the Illinois Central as a switchman, and until May, 1918, he was consecutively conductor, yardmaster, general yardmaster and traveling general yardmaster. During federal control Mr. Beals was assigned to study questions relating to the handling of live stock on the Chicago Junction Railway, reporting to the federal terminal manager at Chicago, Ill. In January, 1919, he was appointed trainmaster of the Chicago terminal of the Illinois Central, and in January, 1924, was assigned to the terminal superintendent's office at the Chicago terminal. On November 1, 1925, at the request of officers of the Florida East Coast, Mr. Beals was selected by the Illinois Central to analyze the operations of the Florida East Coast, acting in the capacity of special representative of Vice-President Rodenbaugh, and on April 1, 1926, he was appointed assistant general manager of that road.

C. L. Beals

A. M. Davidson has been appointed trainmaster of the Northern division of the Chesapeake & Ohio, succeeding **H. N. Walters,** who has been transferred to the Cincinnati division, with headquarters at Stevens, Ky., succeeding **D. T. Evans,** who has been granted an indefinite leave of absence on account of illness.

Thomas Owens, superintendent of the Duluth & Iron Range, with headquarters at Two Harbors, Minn., has been elected vice-president and superintendent, with the same headquarters. **W. A. Clark,** chief engineer, with headquarters at Duluth, Minn., has been appointed also assistant to the general manager, with the same headquarters.

Traffic

W. J. Sheely has been appointed general livestock agent of the Atlantic Coast Line, with headquarters at Savannah, Ga.

H. W. Hicks has been appointed general agent, passenger department, of the Union Pacific, with headquarters at Hollywood, Cal., a newly created position.

W. J. Gilkerson has been appointed general agent, passenger department, of the Canadian National, with headquarters at San Francisco, Cal., succeeding W. F. Barry.

J. P. O'Shaughnessy has been appointed general agent, freight department, of the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at St. Paul, Minn.

W. A. Clawson, chief clerk in the passenger department of the Atchison, Topeka & Santa Fe, with headquarters at Los Angeles, Cal., has been promoted to assistant general passenger agent, with the same headquarters, succeeding **F. J. Heid,** deceased.

E. A. Lalk, general agent, freight department, of the Chicago, Milwaukee & St. Paul, with headquarters at Milwaukee, Wis., has been promoted to assistant general freight agent, with the same headquarters. **W. J. Cavenagh,** division freight agent at Milwaukee, has been promoted to general agent in place of Mr. Lalk.

M. H. McEwen, general agent of the Chicago, Milwaukee & St. Paul, with headquarters at Pittsburgh, Pa., has been transferred to New York as general agent, freight department, succeeding **C. H. Mitchell,** promoted to freight traffic manager. **H. L. McLaughlin** has been appointed general agent at Pittsburgh in place of Mr. McEwen.

J. L. Burgar, general agent of the Chicago & North Western, with headquarters at Cincinnati, Ohio, has been promoted to manager of the department of tours operated jointly by the Chicago & North Western and the Union Pacific, with headquarters at Chicago, succeeding **C. J. Collins,** promoted to general passenger agent of the Union Pacific.

Howard E. Simpson, who has been appointed general eastern passenger agent of the Central of New Jersey, with headquarters at New York, was born on March 15, 1896, in Jersey City, N. J., and was educated in the public schools. When sixteen years of age, he entered the general baggage agent's office of the Central of New Jersey, and a year later was transferred to the passenger traffic department. He then served successively as file clerk, bill clerk and clerk in the advertising department. From November, 1917, to May, 1919, he was in the United States Navy. He then became a purser on the steamer Sandy Hook, operated by the Central of New Jersey, and on July 1, 1922, he became rate clerk. A year later he was appointed city passenger agent at New York. He then became advertising agent of the same road. In January, 1926, he was appointed district passenger agent, which position he was holding at the time of his recent appointment to general eastern passenger agent.

Mechanical

Frank S. Robbins, formerly Philadelphia representative of the Pittsburgh Testing Laboratories, has been appointed superintendent of motive power and machinery of the Florida East Coast, with headquarters at St. Augustine, Fla.

G. E. Johnson, master mechanic on the Chicago, Burlington & Quincy, with headquarters at Sheridan, Wyo., has been transferred to Wymore, Neb., succeeding **H. C. Gugler,** who in turn has been transferred to Sheridan in place of Mr. Johnson.

Engineering, Maintenance of Way and Signaling

W. L. Dayton has been appointed superintendent of signals of the Grand Trunk, with headquarters at Detroit, Mich. **J. P. Coleman,** supervisor of signals of the Detroit division, has been transferred in the same capacity to the Chicago division, with headquarters at Battle Creek, Mich., succeeding Mr. Dayton, and **H. E. Smith** has been appointed supervisor of signals of the Detroit division, with headquarters at Durand, Mich., succeeding Mr. Coleman.

Special

F. Q. Tredway, editor of the Bureau of News of the Southern Pacific, with headquarters at San Francisco, Cal., has been appointed editor of the Southern Pacific Bulletin, with the same headquarters, succeeding **K. C. Ingram,** who has been transferred to the passenger traffic department.

Obituary

W. A. Archer, formerly supervisor of water service of the Atchison, Topeka & Santa Fe, who retired from active service in June, 1923, died at Detroit, Mich., on May 11.

Joseph L. Penney, formerly traffic manager of the Terminal Railroad Association of St. Louis, and was later industrial agent of that company, died at his home at St. Louis, Mo., on May 12.

F. A. Miller, formerly passenger traffic manager of the Chicago, Milwaukee & St. Paul, who retired from active service on December 31, 1917, died in Chicago on May 12 after an extended illness.

William Edenborn, president and owner of the Louisiana Railway & Navigation Company, with headquarters at Shreveport, La., died at his home in that city on May 14, his death following a stroke of apoplexy. Mr. Edenborn was born on March 20, 1848, at Westphalia, Germany, and was educated in the government schools of Westphalia and in a commercial college at St. Louis, Mo. His first connection with a railway was made in September, 1897, when he was elected president of the Shreveport & Red River. In June, 1903, he was elected president of the Louisiana Railway & Navigation Company, of which the Shreveport & Red River became a part, and he held that office until his death. Aside from his railway activities Mr. Edenborn was the inventor of the machine used in making barbed wire. He organized the American Steel & Wire Company in 1899, which was later purchased by the United States Steel Corporation.

W. Edenborn

REDUCED RATES ON THE GERMAN RAILWAYS, between Switzerland and German seaports, became effective April 1. The reduction on business from Basel to Hamburg is 10 per cent; Lindau to Hamburg, 20 per cent; and Singen to Hamburg, 25 per cent. The articles affected are aluminum goods, chemical products, certain vegetables, preserves, tanning products, incandescent lamps, hemp, wood, jute, potash, coconut fiber, coco yarn, silk yarns, artificial silk yarns, artificial silk waste, leather, linoleum, lithopone, marble, phosphates, asbestos, raw rubber, pig iron, rice, starch, earthenware, watches, wax, matches, cement and wine.